MEDICINE SURGERY

INDUSTRIAL HEALTH
OCCUPATIONAL DISEASES
TRAUMATIC, INDUSTRIAL

INDUSTRIAL HYGIENE
INDUSTRIAL MEDICINE
& RAILROAD SURGERY

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War Conference on Industrial Health

American Association of Industrial Physicians and Surgeons
(Thirtieth Annual Meeting)

American Association of Industrial Nurses
(Third Annual Meeting)

American Industrial Hygiene Association
(Seventh Annual Meeting)

National Conference of Governmental Industrial Hygienists
(Eighth Annual Meeting)

April 24-25-26-27, 1945
Drake Hotel
Chicago, Illinois

AS MEDICAL DIRECTOR of the only company in the world producing pure tantalum, DR. CARL OLSON (page 738) is in the throbbing center of information about, and experience with, the astonishing possibilities of its use in surgery. Heretofore this metal has been, as it were, under wraps, the whole output going to the military; and DR. OLSON'S vast fund of data has likewise been on the restricted list so far as publication was concerned. But now that civilian surgery is to share in the supply, a little can be told. It is tantalizingly little, at that—for, at this writing, there is still the ban of "thus much"—but it is enough to lead off the "flood of literature on the surgical use of tantalum," all of which, as DR. OLSON says, "will be well

—Continued on page 6.

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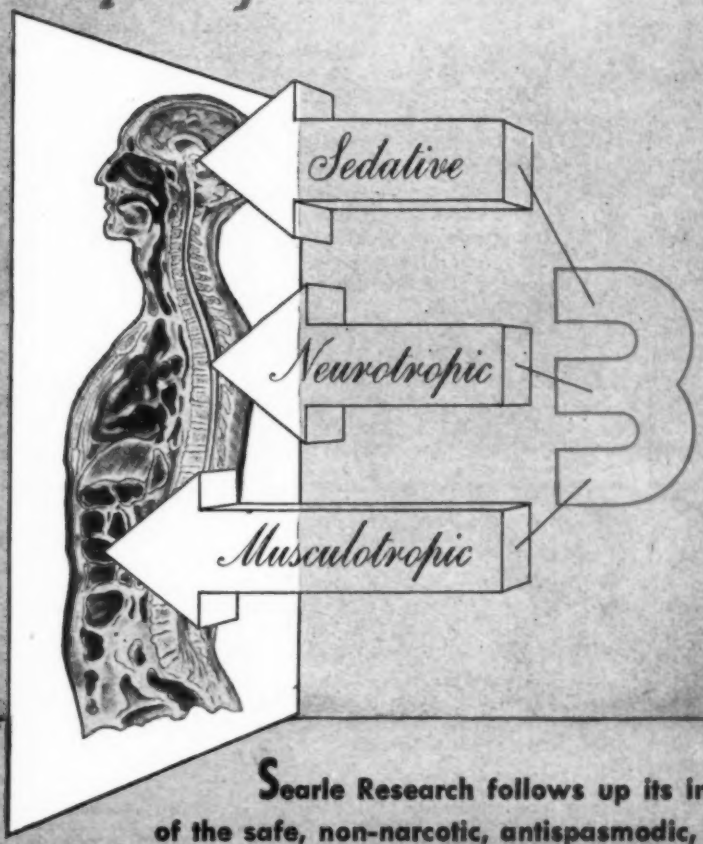

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—*Continued from page 3.*

worth your attention." As and when the restrictions ease still further, DR. OLSON promises other articles, detailing the techniques of some, at least, of the many applications already proved successful . . . DR. VICTOR HEISER, pinch-hitting for Winchell in his "On Broadway" column, says that "Women and their special problems are receiving medical attention in the factories." They are, indeed, not only as individual cases, but also as matters of the scientific studies that aim to develop essential rules and principles. An outstanding example of such studies is presented by DR. BARRITT and his associates at Consolidated Vultee Aircraft (page 669). The conclusions will go far toward easing the trepidation about "women problems" that has been in a fair way to becoming habitual. For, in the light of such research, a good many of these problems are being found not so special as they were long thought. The difference is that they are becoming more understandable, and, with knowledge, the "mystery" disappears. *Readers Digest* for September condenses (from *Argosy*) another Consolidated Vultee investigation—from the personnel rather than the medical angle—likewise eliciting information that will aid in the ultimate satisfactory adjustment of the woman worker to the kind and circumstances of work in which she will be happiest, and thus most effective. Interestingly, one of the counselor findings of the latter study is that women do not work well with tools requiring rotary motion, such as screw drivers; and the author (of the story, not the study) adds: "Try to explain that one." As a part of the general build-up of the science of women-at-work, to which all such studies contribute, FREDA BAKER, of Australia, explains it (page 764): "Certain types of rotary arm motions are particularly fatiguing to women as a result of their different joint construction. Automatic screw drivers should be used wherever possible." It's as simple as that! Which is by way of saying that, in the "try-to-explain-that-one" approach to the "special" problems of women in employment, the "special" is dragged into the study more often that it is found in the problems. This emphasizes DR. BARRITT'S closing paragraphs. . . . DR. RUTHERFORD T. JOHNSTONE'S letter to the members of the WESTERN ASSOCIATION (page 710) is published without comment; its editorial significance is apparent. If any comment were made, however, it might include the reminder that what DR. JOHNSTONE asks for regarding his component society's committees is what the A.A.I.P. & S. is asking for with reference to the program of its "Third War Conference on Industrial Health" (page 3), namely, "your suggestions." The A.A.I.P. & S. committee roster, as now completed, appears on page 8. . . . DR. SPOLYAR'S annual report of his Division of Industrial Hygiene (Indiana) for the fiscal year ended June 30, 1944 (page 770) furnishes an excellent perspective on the range and diversity of the medical, chemical, engineering, and administrative problems involved in the over-all guidance of industrial health. And the form and text of the report strongly suggest the excellent quality of professional interest that was engaged. . . .

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1. Simons, D. J., and Wolff, H. G.: Med. Clin. N. Am., Phila., W. B. Saunders Co., p. 440-441, 1944.

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DR. JOHN J. MOORHEAD, Medical Director of the Interborough Rapid Transit System, New York, from 1908 until unification with the New York City Transit System four years ago, since which time he has been medical director of the latter, was announced as having decided to retire from this industrial affiliation August 1, but a later report says that he has consented to continue in the position for another year at the request of the board of transportation. "On December 7, 1941, DR. MOOREHEAD, professor of clinical surgery at New York Post-Graduate Medical School and Hospital, Columbia University, was lecturing to a group of physicians in Honolulu when the Japanese attacked. He immediately organized surgical teams for operative treatment of the wounded, and remained in Hawaii during the emergency on active duty as a colonel in the medical corps."

DR. EARL F. LUTZ, chief plant physician at the Detroit Diesel Engine Division of General Motors since 1938, has been appointed Assistant Medical Consultant for that corporation, in which position he will work with DR. C. D. SELBY, Chief Medical Consultant, with special attention to the medical aspects of the employment of war veterans. DR. LUTZ was born in Wyandotte, Michigan; received his medical degree at University of Michigan in 1922. He is a Fellow of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS.

DR. JOHN J. LALLI, Jackson Heights, New York, has been appointed Plant Surgeon for Keystone Plating and Rustproofing, Inc., which is at present 100% in war work.

DR. JOHN J. WITTMER, DR. LYDIA G. GIBERSON, DR. MELVILLE H. MANSON, DR. IRVING GRAY, and DR. FREDERICK H. SHILLITO, from industrial backgrounds, and DR. JEAN A. CURRAN, DR. S. POTTER BARTLEY and DR. THOMAS D. DUBLIN, from the College, are the Advisory Committee which is planning the Third Post-Graduate Course in Industrial Medicine to be presented by the Long Island College of Medicine (page 701).

H. G. DYKTOR, chief engineer, Bureau of Industrial Hygiene, Michigan Department of Health, during the last four and a half years, has resigned, to become Chief of the newly-created Bureau of Industrial Hygiene in the Division of Health, City of Cleveland, Ohio.

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A SERIES of six lectures on various aspects of Industrial Health was given to the senior medical students at Hahnemann Medical College, Philadelphia, by personnel of the Bureau of Industrial Hygiene, Pennsylvania Department of Health, during the month of July. Those conducting the course were DR. JOSEPH SHILEN, Director, and MR. FRANK J. WILLARD, JR., Engineer.

DR. LEROY U. GARDNER, Saranac Lake, New York, and DR. C. O. SAPPINGTON, Chicago, were among the speakers on the program of the annual meeting of the Utah State Medical Association, Salt Lake City, August 25-26.

DR. EDWIN H. PLACE, Resident Officer in the U. S. Public Health Service, has been reassigned from the industrial Hygiene Service, Georgia Department of Public Health, to the U. S. Maritime Commission to assist in the study of welders and welding hazards in representative shipyards.

DR. GROVER C. WEIL, 60, Chief Surgeon of the Pittsburgh Coal Company, died suddenly at Lake Placid, New York, August 17.

DR. A. W. GEORGE, Chief Surgeon, Packard Motor Car Company, died at Harper Hospital, Detroit, Friday, July 21, after a long illness. DR. GEORGE was born in Baltimore, Maryland, 60 years ago; received his degree in medicine from Baltimore Medical College in 1911; shortly afterward joined the staff of Providence Hospital as Resident Surgeon; and, on April 23, 1914, went to the Packard Motor Car Company as Chief Surgeon, which position he held actively until his physical condition forced him to enter Harper Hospital last May. He was a Charter Member and Fellow of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. For 30 years he devoted himself to his chosen specialty, Industrial Medicine. He was a pioneer in this field, and the principles he established have stood the test of time. He also was a member of the Wayne County Medical Society, Michigan State Society, American Medical Association, and MICHIGAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. In *Detroit Medical News*, August 28, DR. JOSEPH L. ZEMMENS adds the tribute: "His judgment was always excellent. Everything he did was done well."

DR. FREDERICK ATWOOD BESLEY, 76, Waukegan, Illinois, secretary and treasurer of the American College of Surgeons and a former president of that organization, died August 16. A native of Waukegan, he received his medical degree from Northwestern University in 1894 and began practice in Chicago the same year. At the outbreak of World War I, he organized a Northwestern university hospital unit which he

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headed in France. In 1920 he established the Besley-Waukegan clinic in Waukegan. He was professor of surgery at Northwestern for 25 years. His industrial affiliations included a number of local organizations for which he had been chief surgeon and surgeon since 1926. He was one of the prime movers in the A. C. S. Committee on Industrial Medicine and Traumatic Surgery.

GENERAL

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DR. H. W. WELLMERLING, President of the Ambulatory Fracture Association, 33 North LaSalle St., Chicago 2, announces the fifth annual meeting of that organization, to be held Friday and Saturday, October 13 and 14, "for the study of skeletal pinning and external fixation."

Employer Plans Preferred

IN ITS July roundup of Washington news, *Nation's Business*, publication of the U. S. Chamber of Commerce, offers this bit of enlightenment: "Group health insurance plans are being developed aggressively by principal underwriters. Studies indicate employers may obtain complete health coverage for all workers and families (without med-

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—*Ohio State Med. J.*, August, 1944.

Industrial Insurance Facts

LIFE insurance benefits of $6,477,258 have been paid to employees of E. I. du Pont de Nemours & Co. and their beneficiaries since adoption of a group insurance plan a quarter century ago. A total of 4750 employees or their families have

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"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area—because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

With tissue repair under way, and only erythema remaining, the use of **Domeboro Ointment** (each ounce of which, in a special hydrophilic base, possesses the therapeutic action of one Domeboro Tab diluted in a pint of water), permits a quicker return to work, while healing is promoted by its efficient topical action.

(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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participated in the benefits, according to a company announcement marking the plan's 25th anniversary. The plan was adopted in 1919 as a wholly company-financed program and has been maintained on that basis. All employees receive policies upon completion of one year of service. Graduated increases in coverage with each year of employment are provided for employees with dependents, the coverage increasing from $700 at the end of a year to $1500 at the end of five years. Insurance now in force totals approximately $85,000,000, not including that of subsidiary companies, to which coverage also is extended. More than 74,000 employees are insured, including workers at government plants operated by DuPont. The statistics show the mortality rate among company employees to be well below the average indicated by general actuarial experience. Officials attribute the showing largely to an active safety program, annual medical examinations of employees and careful attention to industrial health measures. In addition to the life insurance payments, the company reported accident and health benefits of $9,423,980 paid to employees under the accident and health insurance plan in which the cost is shared by the company and the insured. This plan was put into effect in 1930. Weekly benefits for non-occupational illness or injuries are paid, supplementing disability wages disbursed to employees on sick leave.

—*Medical Times*, August, 1944.

Industrial Nursing

AN INTENSIVE course in Nursing in Industry was given at Syracuse University, July 4-14, under the direction of MARGARET NICHOLS, R.N., industrial nursing consultant, Division of Industrial Hygiene, New York State Department of Labor. Registrants included industrial and public health nurses and one hospital nurse. Experts in industrial medicine and toxicology, chemistry, engineering, ophthalmology, mental hygiene, nursing, nutrition, safety, operation of community agencies, and personnel management participated. The increasing interest in post-graduate study by industrial nurses indicates a better understanding of the importance of preparation in the expanding field of industrial nursing.

No Multiple Amputations

THE Army Surgeon General's Office has dismissed as baseless and irresponsible another "loose talk" rumor circulated since D-Day—that there have been multiple amputations (men who have lost both arms and legs) among Americans on the fighting fronts. Not a single such case is on record either in Army hospitals in the United States or in base hospitals in England, the Surgeon General's Office said. Even cases of soldiers losing two limbs are rare, only 58 being listed in the last official report on March 31. Army officials added that no amputee is discharged from the service until he has been fitted out with artificial limbs and has been taught fully to use them. Replacements, as more efficient equipment is developed, are made available to discharged veterans without fee through the Veteran's Administration.

Conference and Seminar

THE Massachusetts Medicolegal Society in conjunction with the medicolegal departments of Harvard, Boston University and Tufts Medical Schools has arranged for an all-day Conference to be held at the Mallory Institute of Pathology, Boston City Hospital on Wednesday, October 4, 1944. This will include lectures, demonstrations, and informal discussions concerning many subjects in legal medicine, particularly stressing some of the more recent procedures. The meeting will be open to any registered physician, lawyer, police official, senior medical student or other medical investigator who may be interested and care to register. No limit in number has been made. There will be no fee for registration. While advance application is not essential, it would be helpful to those arranging the conference if notice of intention to attend be sent prior to October 1 to Dr. W. H. Watters, Department of Legal Medicine, Harvard Medical School, Boston. . . . THE Harvard Medical School, Courses for Graduates, with the cooperation of the Medical Schools of Boston University and Tufts College, offers a seminar in Legal Medicine to occupy the entire week of October 2-7, inclusive. It is planned particularly for medical examiners and

This is a cross-section of the Machlett Dynamax X-ray tube. The ball bearings support the anode, which rotates at 3000 r.p.m., and reaches a temperature of 1000° F. The entire structure is in a vacuum of about 10^{-6} mm. of mercury, or a billionth of an atmosphere.

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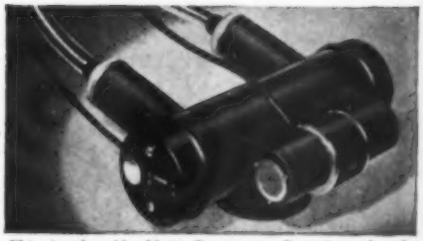
This tube has a focal spot so small as to produce exceedingly sharp pictures, and an X-ray beam so intense as to make possible exposures as short as 1/60th sec. It was the solution of the lubrication problem that added reliability to these advantages. Machlett employs many other advanced techniques in the manufacture of its various types of high-vacuum tubes for medical, scientific and industrial purposes . . . Machlett Laboratories, Inc., Springdale, Connecticut.



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coroners physicians, but will be open to any other suitable graduate of an approved medical school. The course will be practical rather than theoretical, and will consist of autopsy demonstrations, technique and interpretation of laboratory tests, study of the day-by-day cases of a medical examiner, round table conferences, and the many subjects now included in the widening field of legal medicine. In order that each participant may receive the maximum benefit, the enrollment has been limited to 15. For the Seminar the fee is $25. Application should be made on or before October 1 to Harvard Medical School, Courses for Graduates, 25 Shattuck Street, Boston 15, Massachusetts.

Ohio Industrial Commission

THE Industrial Commission of Ohio disbursed $3,457,727.45 for medical services to injured Ohio workmen during 1943, according to a recent report of E. I. Evans, chief actuary. Included in that figure is a relatively small amount for dental services. Other expenditures during the year included $1,801,325.00, hospital care and nursing; $130,821.34, funeral expenses, and $97,001.18, court costs, a total of $5,486,874.97. These amounts include payments covering treatment of injured private and public employees, as well as similar costs on occupational diseases, and are in addition to death awards and compensation to injured workmen. Comparative figures for 1942 were as follows: $4,243,069.09, medical services; $1,760,898.69, hospital care and nursing; $133,104.41, funeral expenses, and $86,661.34, court costs, a total of $6,223,733.53. The considerable decrease in 1943 of the amount disbursed for medical service is of no special significance, as a change by the Auditing Department of the Industrial Commission in the method of compiling records in 1942 resulted in the inclusion in the 1942 figure of approximately $800,000 of medical fees which had been allowed late in 1941, but were actually paid in 1942. The amount disbursed by the Commission for medical service during 1941 was $3,322,792.06. The number of claims filed during 1943 was 331,072, a record for the 32-year history of the Ohio Workmen's Compensation Fund. There were 320,793 claims filed in 1942, the previous peak year. The total for 1932, during the depression, was 130,099. "Medical only" claims, involving payment for physicians' services but no compensation to the claimant for loss of time, numbered 260,150 in 1943, or 78.6% of all claims filed, compared with 80% in 1942. The average fee of "medical only" claims increased from $7.69 in 1942 to $7.88 in 1943.

—*Ohio State Med. J.*, August, 1944.

Credit Where It is Due

INDUSTRIAL hygiene activities centering in the U. S. Public Health Service have been greatly improved and intensified during this war. During the last war, in a single shell-loading plant operating for about 20 months, there were 7,000 cases of systemic poisoning from TNT and 105 deaths. In some 20 shell-loading plants in this war, reports covering 18 months' experience indicate that there were only 284 lost-time cases of systemic poisoning due to TNT and only 14 deaths. Skin disease due to contact with TNT was almost universal in shell-loading plants during the first World War. In the 20 plants cited above, there have been only 158 cases of dermatitis in this war. In the fiscal year 1942, 35 state and local units rendered industrial hygiene services to nearly 6,000 establishments employing over 2¼ million workers—all in war industry. This has been a rapid expansion in the industrial hygiene services, but it has not kept pace with the expansion in industry.

—PAUL V. MCNUTT, at a Hearing of the U. S. Senate Subcommittee on Wartime Health and Education, July 10, 1944.

"Model" Group Insurance

A "MODEL" group insurance plan has been approved by the board of directors of Continental Can Company, Inc., and was to go into effect June 10, provided that 75% of the company's eligible employees throughout the United States, Cuba and Canada had enrolled by that time. The revised plan not only doubles the amount of life insurance formerly made available to employees but also adds completely new protection to cover sickness and accidents, hospital confinement for both employees and dependents, and surgical operations for employees. The company will pay a large share of the new and increased benefits, and insured employees will pay small, fixed contributions each

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month. The plan provides death benefits roughly equivalent to one and one-half to two years' pay; weekly sickness and accident payments for as long as 13 weeks; hospital insurance for as long as 31 days, plus reimbursements for extra hospital charges; similar hospital benefits on a lesser scale for dependents; and defrayment, according to a fixed schedule, of operation costs resulting from non-occupational disabilities.

—Abst. from *Man. Rev.*, June, 1944, in *Industrial Hygiene Digest*, July, 1944.

Local Health Programs

A YEAR ago your Committee on Industrial Health was privileged to report the basic plans for a local industrial health program in the city of Kenosha. At that time all preliminary steps had been taken to initiate a program of medical care and placement physical examinations for the employees of the Snap-on Tools Corporation. The details of the plan were being formulated by the personnel of the Kenosha County Medical Society and the management of the Snap-on Tools Corporation. Since then the plan has been put into active operation, and the success of the program has encouraged your committee to advocate an expansion of this type of industrial health plan in other communities. It is the recommendation of your committee that emphasis on this phase of the program be the central core of industrial health activities during the coming year. While the clinics have been an unquestioned success, and have served to identify the problem of industrial health as common to all groups concerned with industrial efficiency and the welfare of workers, the time seems right to translate some of our thoughts concerning medical care of workers into concrete action. During the forthcoming year we hope that plans similar to that being carried on in the Snap-on Tools Corporation, Kenosha, can be duplicated in various parts of the state.

—From Report of the Committee on Industrial Health, GUNNAR GUNDERSON, Chairman, *Wisconsin Med. J.*, August, 1944.

Fur Industry

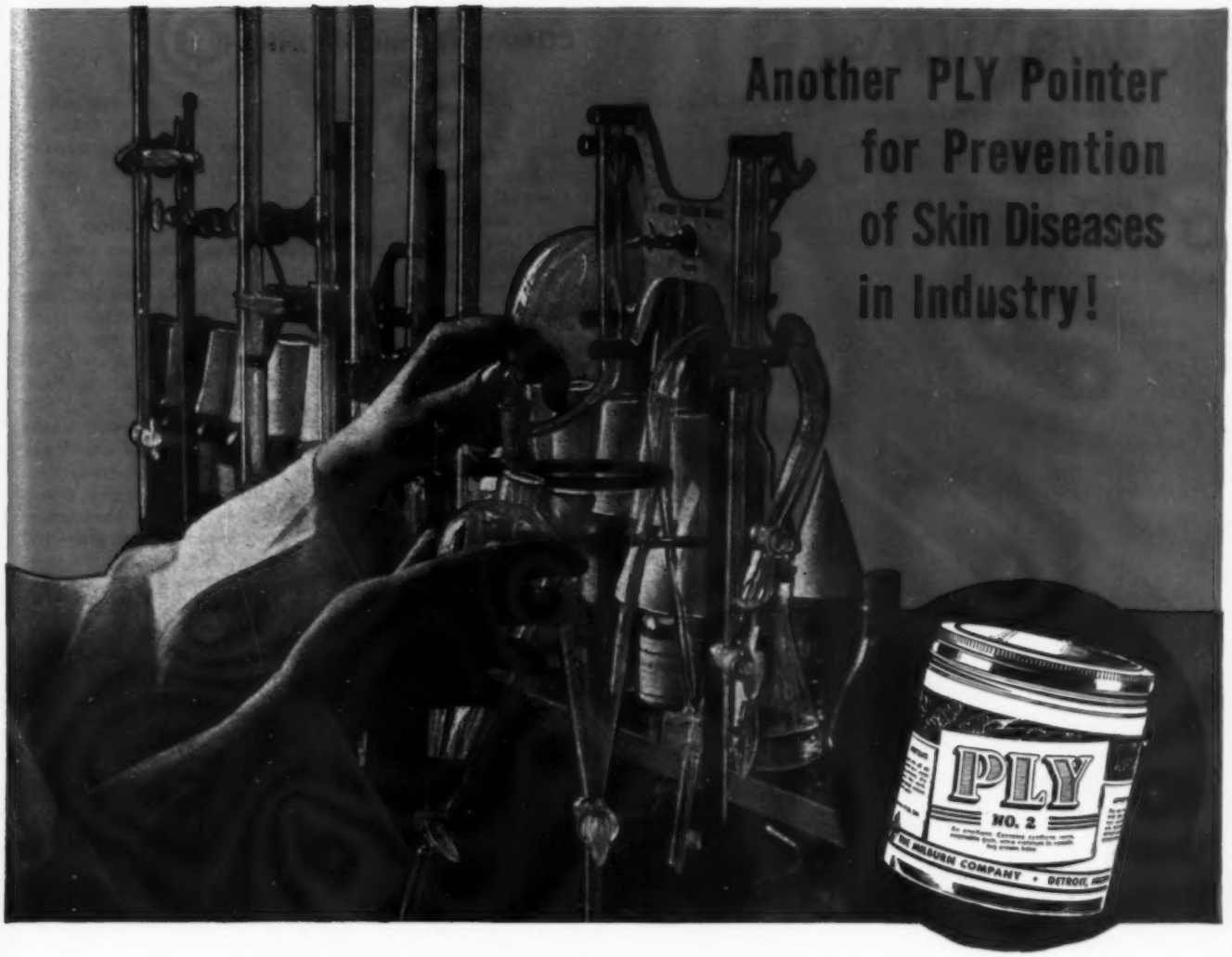
BASED on a medical study of 694 workers in the fur industry it is concluded that: (1) Traumatic affections of the skin appear characteristically among the occupational groups of fleshers, unhairers, hand-stretchers and nailers. (2) The cases of dermatosis appear among those workers who handle the dyed furs and are not related to cleanliness, hand-cleaners, or the complexion of the worker. (3) All cases of dermatosis gave a positive reaction to patch tests applied with the appropriate dye in the proper concentration, emphasizing again the diagnostic value of these tests. (4) When dyes of the paraphenylenediamine series are used for test materials, cases of asthma among fur workers may show negative scratch tests, while the patch tests are positive. (5) There is no evidence that pulmonary tuberculosis is more frequent among fur workers than in the general population. (6) The relative frequency of acute and chronic non-specific upper respiratory disease among fur workers, may be due to the dust present in the environmental air.

—From "Survey Made of Health Problems in the Fur Industry of New York," in New York State Department of Labor's *Industrial Bulletin*, June, 1944.

Dental Defects

FOR the period November, 1940, to January, 1942, 8.8 of each 100 men examined failed to meet the dental standards for acceptance by the Army, according to the standards then established. For the period February 13, 1942, through January 31, 1943, only 0.8 of every 100 men examined failed to meet the dental standards, while from February 1, 1943, to the present, the rate dropped to 0.5. This required a tremendous dental program by the armed forces and the taking of approximately one-third of the practicing dentists into the Army and Navy to effect the dental rehabilitation. In the pilot test states of Maryland and Virginia, the Selective Service dental rehabilitation program operated slowly but satisfactorily for the short space of time the experiment was conducted. The dental cases rehabilitated were largely those of extracting infected teeth and replacing these with artificial prosthetic dentures. The average cost of dental rehabilitation per registrant was $60.03, and the average time from certification to cure was 45.5 days.

—CAPTAIN C. R. WELLS, DC-USNR, at a Hearing of the U. S. Senate Subcommittee on Wartime Health and Education, July 10, 1944.



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by Joseph L. Fetterman, M.A., M.D., Assistant Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio

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COMMENT and OPINION

Sales Problem

THE greatest barrier to the promulgation of the industrial health program is the lack of sustained interest in industrial health exhibited by most of the small corporations. The medical profession is placed in the rather anomalous position of having both to create and supply the demand for a comprehensive program in industry. It would appear that the most comprehensive field of endeavor is a planned program for the education of industrial executives and labor leaders along these lines.

—From Report of Committee on Industrial Health, *Illinois M. J.*, July, 1944.

Lay Domination

WE MUST regain control of our hospitals. That the professional affairs of a hospital be made subordinate to its business management is intolerable, and even contrary to good business principles. We must oppose, with all our power, the evils of current forms of hospital insurance. My personal opinion is that the only proper form of insurance is one which pays the patient a lump sum for a given illness, to be used as he sees fit, and which also makes the total amount of insurance well below the estimated cost of the illness. To insure a house for its total value or more would be to invite arson. I regard the present provisions of these policies in giving a definite fee for a given treatment as vicious. No insurance company or any other lay agencies has a right to value our professional services.

—From "Lay Domination of Medical Practice," by W. D. GATCH, M.D., Dean, Indiana University School of Medicine, in *J. Indiana State M. A.*, August, 1944.

"Scientific" Sadism

DR. ARTHUR V. ALLEN, for 30 years Chief Surgeon for the Commonwealth Edison Company, Chicago, is quoted in *Chicago Herald American*, August 16: "The end (of vivisection) does not justify the means. Ambitious individuals with mistaken idea as to the ways and means of the progress of medicine ride this horse too hard. There is a tendency to get knee deep into vivisection. I've seen too many dogs suffering on vivisection tables. Anesthesia cannot always be employed if the experimentalist is going to get the visible reactions that he must have. Dogs with tubes in their stomachs, dogs suffering in every organ, dogs being used unmercifully to meet demands of the gland fanatics—the sight of them is heart-rending. To my mind the greatest boons to the human race are going to come out of the chemists' laboratory rather than out of the vivisector's chamber. Many other physicians feel much as I do about it. Of course, as long as dogs are available to the vivisector as they are at the dog pound under present conditions, there is always a chance for any sadist, even among the laity, to do his hideous work."

Economics of Compensation

WHILE we are bent upon restricting the compensation laws to cover only the losses resulting from strictly occupational injuries, labor reinforced by popular sympathy, is driving to extend them to cover all injuries to body or health that flesh is heir to, howsoever occurring. In other words, labor needs and wants health and life insurance and looks upon an extension of the compensation law as the most readily available measure to supply that need. If we object to that program—and we have very sound objections to it—should we not look for some alternative method of supplying labor's needs—in other words, study the most economic forms of employee's mutual benefit associations, with adequate sickness and life insurance features, to care for those afflictions of employees which the compensation laws do or should ignore, and institute a drive to organize them? In that way the pressure to pervert the compensation law to purposes for which it was not intended and is not adapted, would be relieved.

—From "Workmen's Compensation—A Growing Burden on Industry," by F. ROBERTSON JONES, in INDUSTRIAL MEDICINE, May, 1934.

Vitamin B_1 for Seasickness

THE public press recently reported work by Holmes on the use of vitamin B_1 in the prevention of seasickness and airsickness. Remarkable results were obtained, some sailors who heretofore invariably became seasick now remaining perfectly well through very rough weather after having undergone the prescribed treatment. The simplicity of the treatment is remarkable, consisting only of taking 15 mg. of B_1 by mouth on each of the two days just preceding a trip by water or air, and thereafter only in rough weather.

—*Medical Times*, August, 1944.

Hygiene Reduces Hazards

HEALTH hazards in our factories are far less numerous than in the average home. Protection has come about through education. Many an individual has been taught how to safeguard his own body. By means of proper ventilation and devices which prevent the escape of noxious vapors, many jobs have been rendered foolproof. A generation ago similar tasks carried a distinct element of danger. Nevertheless, workers are called upon to deal with toxic agents. We still have victims of industrial poisoning as a result either of carelessness or because adequate defense measures have not been adopted. We must recall that certain

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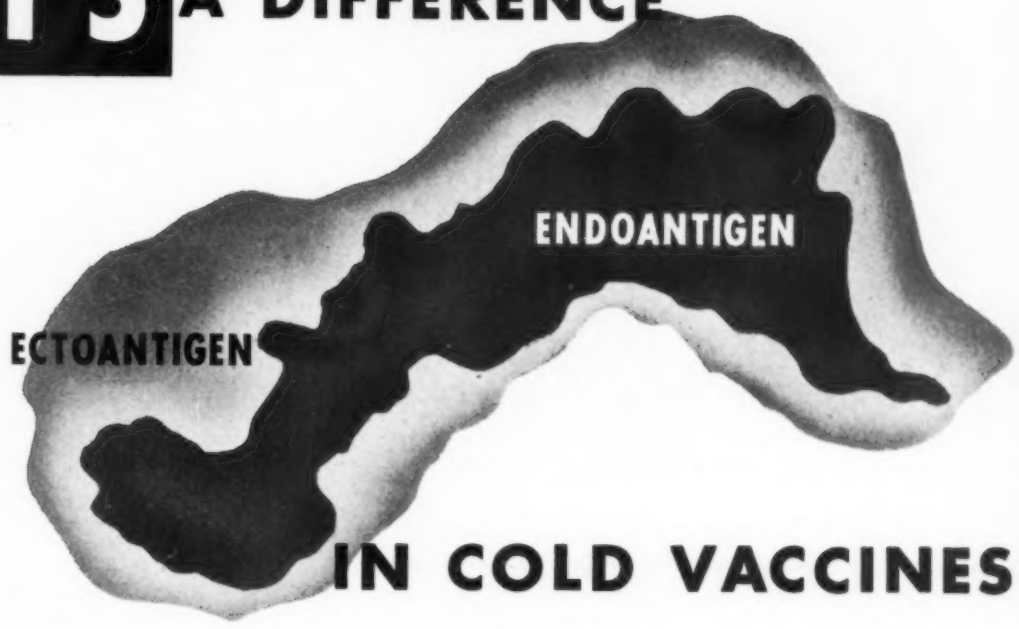

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dusts, solvents, oils, and gases can disturb the breathing apparatus, the skin, or accentuate a systemic disorder. To the credit of modern factory planning, let it be recorded that serious cases are few in number. Various types of manufacturing procedures involve contact with lead. Here the plant doctor will watch for manifestations such as loss of appetite, constipation, and abdominal colic. Fortunately, paralysis—which is an unusual complication—will be encountered in only a few instances. Even though it exhibits itself, it should carry no disability. Whether the disease will go that far depends upon the resistance of the employee. One thing the medical staff can do is to make blood checks.

—Dr. Irving S. Cutter, in his daily feature, "How to Keep Well," in *Chicago Tribune*, May 17, 1944.

Eye Accidents

AMATEURS trying to extract a particle lodged in an eye accounted for 10.2% of eye accidents, according to a survey on artificial eye wearers recently completed by Paul Gougelman, Sr., artificial eye manufacturer, in cooperation with the Greater Chicago Safety Council. The survey further revealed that 58% of all artificial eye wearers in nine major cities in the United States were the victims of accident which destroyed vision. Based on 4,825 cases in Chicago, St. Louis, Washington, D. C., Cleveland, Pittsburgh, Detroit, Milwaukee, Kansas City and Minneapolis from 1940 to 1944, the survey showed that 2,785 persons lost an eye in home, automobile, occupational or public accident. Leading all causes of accidents was the commonplace job of chopping wood. A chip of wood flying into an eye caused 15% of all eye injuries. Careless use of scissors, wire, nails and hammers, and falls around the home were next. On-the-job accidents resulting in pieces of steel entering the eyeball accounted for 14.4%. Eye injuries in industry, however, are sharply decreasing with use of modern safety devices such as goggles, safety masks and helmets. Other causes included explosions of bottles and jars, and B.B. shot. Forty-eight children lost the vision of an eye in Chicago alone between 1940 and 1944, due to playtime accidents, and hurling of sticks or stones. It is estimated that there are some 300,000 wearers of artificial eyes in the nation, 175,000 of which are accident cases.

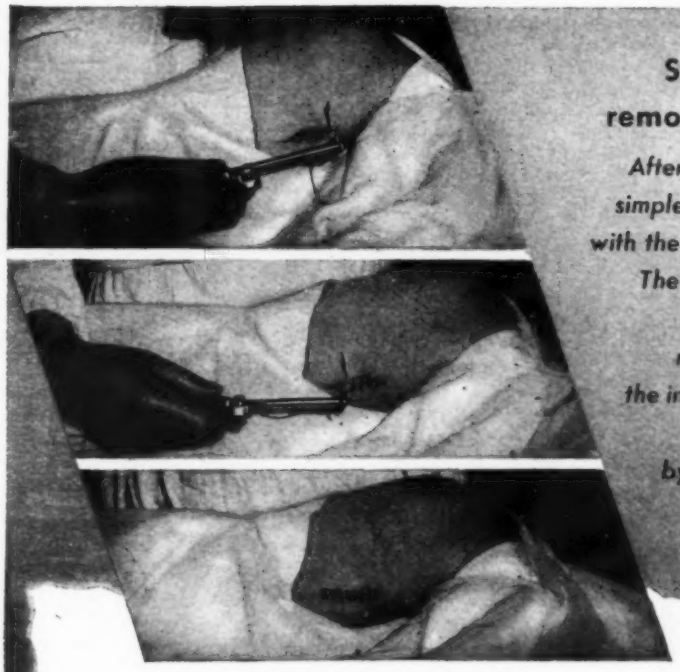
Electric Arc Welding

ELECTRIC arc welding which is done in large rooms and where the fumes are not allowed to concentrate excessively near the breathing level, does not cause any lung changes even after many years of work. (2) Excessive inhalation of concentrated fumes, especially in confined and unventilated spaces, may cause siderosis in the lungs in from six to 10 years. The siderosis so produced consists only of inert iron pigment deposits in the lymphatics, without fibrous tissue proliferation and without progressive changes after exposure is materially decreased. (3) Electric welding or siderosis do not predispose to tuberculosis or other lung infections. (4) The siderosis of welding causes no functional impairment of the lungs and, therefore, no symptoms referable to the lungs. (5) Acute irritative phenomena of the throat may occur with too prolonged confined work in dense clouds of fumes, but these appear to be transitory reactions leaving no residual impairment. (6) Any respiratory involvement may be prevented in welding, even with the most confined and prolonged work, if proper precautions are taken, either by adequate exhaust ventilation, ventilated helmets, or positive pressure respirators.

—From "Further Observations on Lung Changes in Electric Arc Welders," by O. A. Sander, M.D., in Industrial Health Section, *Illinois M. J.*, July, 1944.

Army Industrial Medicine

THE ARMY is very likely the largest single employer in the country today. Not only does it operate its own arsenals, depots and industrial plants, but also the Surgeon General's Office is responsible for sanitation, hygiene and medical supervision over army owned contract operated installations which are located on military reservations. The chain of responsibility extends through the Surgeon General, who establishes policy and maintains advisory supervision, into the service commands, the army air forces, to the ports of embarkation under the



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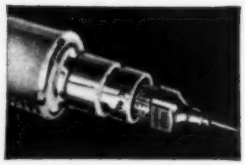

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control of the chief of transportation, and to the chief of ordnance. In the Surgeon General's Office the Occupational Health Division functions in the Preventive Medicine Service. It establishes policy, gives technical advice, supervises the Army Industrial Hygiene Laboratory and maintains liaison with other governmental agencies concerned with industrial health and safety. The Army Industrial Laboratory, located in the School of Public Health at Johns Hopkins University in Baltimore, surveys army industrial installations as to environmental hygiene and provides medical and engineering consultation to control occupational health hazards. The plan of organization in each service command includes the appointment of a qualified industrial medical officer and a qualified sanitary corps officer as the industrial hygiene engineer, acting under the direction of the service command surgeon. These officers make inspections, recommend the installation of new or additional medical facilities, participate in industrial hygiene surveys and cooperate with other personnel in the service command in the control of absenteeism and the prevention of industrial accidents. Requests for assistance from the Office of the Surgeon General are transmitted by the commanding general of the service command. The commanding general of the Army Air Forces makes use of the central agency set up in the Surgeon General's Office. He also is empowered to provide personnel for developing industrial medical services in army service forces commands and designates qualified medical officers and sanitary officers to conduct adequate industrial health programs. The chief of transportation acts in an identical capacity at the ports of embarkation. In the installations themselves medical responsibility may reside in a medical officer, a contract surgeon or civilian physician as circumstances suggest. In any case the duties include physical examination (preplacement and periodic), emergency care, immunization, control of occupational health hazards, maintenance of proper reports and records, industrial hygiene consultation services, health programs, cooperation with safety programs and the necessary measures for a healthful work environment. In all of these services the responsible officer is assisted by the industrial hygiene engineer. Special regulations apply to personnel. Civilian physicians qualify for assignment through civil service, or contract surgeons are employed to conduct the medical services at all army operated industrial plants. Such employment customarily follows after authorization by a service command and after clearance with Procurement and Assignment Services. Funds are allotted by the service command. Registered graduate nurses not eligible for service in the Army Nurse Corps are generally employed in army operated plants. This rule can be modified only by special action of the commanding generals of the army service forces or army air forces. Supplies and equipment are available from the Surgeon General or appropriate medical department distribution depot.

—*J.A.M.A.*, July 29, 1944, referring to "Industrial Medical Program of United States Army," Circular 198, War Department, Washington, D. C., May 20, 1944.

Management of the Silicotic

THE general practitioner has a large share in the responsibility for the proper management of the silicotic patient. In addition to treating him for the relief of his symptoms, the physician must also advise him if and when a change of employment is advisable. The indications for such a change are fairly clear-cut, and there is no justification for taking a man from his job merely because he has simple silicosis. The factors which influence the decision to take a man from his job are the safety of the patient, his age, degree of disability, economic status, and his value to industry.

—PAUL J. BAMBERGER, M.D., Climax, Colorado, *Rocky Mountain Med. J.*, 41:6, June, 1944, quoted in *Ohio State Med. J.*, August, 1944.

British Journal

THE first issue of the *British Journal of Industrial Medicine* was published in January, 1944. This is an official journal of the British Medical Association and it is interesting to note that this Association has taken cognizance of the importance of the specialty of industrial medicine. The following is an excerpt from the "Foreword" by Lord Moran: "An industrial doctor, whether whole time or part time, will neglect his unusual opportuni-

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Bausch & Lomb Safety Lenses are available, plano or prescription ground, in various types of metal frames or cup type goggles. Prescription ground impact resistant lenses (single vision or bifocal) professionally prescribed to the visual requirements of the job, can be worn with the comfort and convenience comparable to that of workers' regular glasses. Write for complete information, Bausch & Lomb Optical Company, 602 St. Paul St., Rochester, N. Y.

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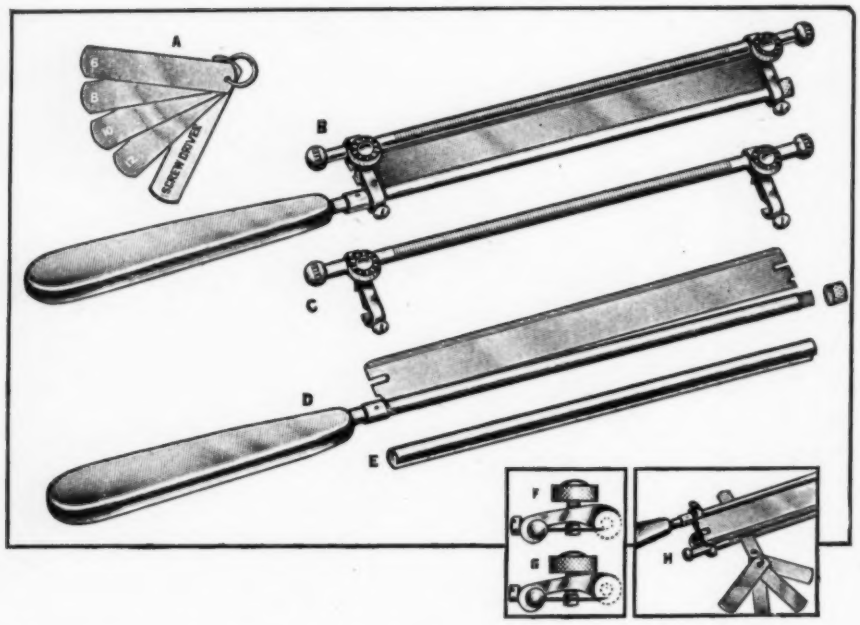

Now Offered with Detachable Blade and Thickness Gauges

Modified Blair-Brown Skin Grafting Knife with Marck's Thickness Determining Attachment

At the suggestion of many users, the new Blair-Brown Skin Grafting Knife is now offered with a detachable blade and the Marck's Thickness Determining Attachment is now furnished with a set of four copper plate gauges for accurately regulating the thickness of the desired skin graft from 6 to 36 thousandths of an inch in 2 thousandths inch steps. In use, the gauges are selected for the desired thickness and are then placed between the knife edge and the threaded grip rod as shown in illustration "H" above. The knurled thumb screws at both ends of the Marck's Attachment then are adjusted until the space between the grip rod and knife edge provides a light tension on the gauges.

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B-B967 — Modified Blair-Brown Skin Grafting Knife, "B," complete with one blade, Marck's Thickness Determining Attachment and set of four gauges..... **$18.50**

B-B968 — Modified Blair-Brown Skin Grafting Knife, "D" (same as above but without Thickness Determining Attachment)..... **$8.50**

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ties if he fails to study working conditions. He must learn to control the hazards of industry, he must be versed in the diseases and poisons peculiar to the lives of the men for whose well-being he is responsible; he ought to be skilled in the treatment of accidents. But first and last he must be a good doctor. If he is, all the rest will be given unto him. He will enjoy singular opportunities of clinical study. James Mackenzie went to St. Andrews that he might keep a small community under unbroken observation for a period of years. The industrial doctor will have such a community under his hand. He will be able to follow the history of the men employed by his firm and at the end he ought to be able to contribute to our knowledge of the natural history of important diseases such as duodenal ulcer. The long-established Medical Branch of the Post Office has shown how this can be done and what may come of it. But the industrial doctor of the future must have close links with the main chain of general medicine. Academic centres of industrial medicine will arise, as in the new organization at the London Hospital, and the whole-time industrial medical officer of the big firms may probably become in time a specialist and consultant in this field. Thus the structure of industrial medicine will be similar to the general structure of the medical services of the country, working along parallel lines for the good of this important section of the community. It is because of all this that an authoritative scientific journal dealing with these matters is more than welcome. And I have tried to indicate my belief that the *British Journal of Industrial Medicine* should be of the very highest assistance not only to the whole-time industrial doctor but to every doctor whose patients are engaged in industry and who himself may, from time to time, be called upon to advise in local industrial problems."

—Industrial Health Section, *Illinois M. J.*, July, 1944.

At the Grass Roots

CREATIVE powers of the people are at the grass roots," says Emory S. Bogardus in Democracy by Discussion. In North Carolina capable leadership of local community health education programs has been formed in all groups without regard for social, economic, or racial backgrounds. People have realized, some of them for the first time, that they have a real responsibility for the health and welfare of their neighbors. They have realized, too, that their own apathy and indifference have allowed certain social and economic conditions to exist that they now know must be changed. The democratic spirit that is so greatly needed in the world today is exemplified by this type of program. People think together, study together, and then act together. Many of the people formerly thought that the exclusive duty of the health department was to care for negroes and poor whites. Now, a new concept of the scope and caliber of health department service and capabilities is slowly spreading. The composite essential parts of the total health program of tomorrow promise to be: communicable disease control, sanitation, maternal and infant care, school health programs, nutrition, dental health, mental hygiene, housing, social and economic welfare, and certain aspects of medical care. The responsibility of the state is to all the people, and, through democratic health education, the departments of public health can best attempt to bridge the gap between knowledge and skill, and thus discharge this serious obligation entrusted to them by law.

—From "Planning for Health Education —The State Program," by J. C. KNOX, M.D., Director, Division of Epidemiology, N. C. State Board of Health in *Public Health Reports*, July 21, 1944.

Attention to Safety and Health

IN GENERAL, British factory inspectors concluded that women were safer workers than men, though they were reported to be more liable than men to certain types of accidents, such as those due to hair or clothing catching. The Minister of Labor repeatedly stressed the importance of guarding machinery, pointing out that some of the most serious accidents to women were due

"... up there at the front you begin to wonder about a good many things you were taught in medical school ..." [1]

The Battalion Surgeon was talking . . . the man who has to get results,—and quickly, with what's at hand in the combat area.

He must be practical . . . thinking in simple terms about burn treatment under battle front conditions.

That's why, in both military and civilian practise now, observers [2, 3, 4] are reporting on the satisfactory use of petrolatum for burn surface treatment:—both as covering dressing to protect promptly against contamination following the injury, and later as dressing in conjunction with other treatment of the burn area.

'Vaseline' Petroleum Jelly offers the physician simple, prompt first aid treatment for the burn surface and a satisfactory dressing later for deeper burns. Available in tubes and jars. 'Vaseline' Borated Petroleum Jelly is available in tubes only.

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THE *enormous frequency of minor burns* makes them as important in the sum total of human suffering as the relatively infrequent critical third-degree burns.

You will find UNGUENTINE a valued aid in the common minor burns of daily practice, because:

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2. ***Unguentine is antiseptic.*** It fights infection with sustained contact and action.
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to lack of proper guarding. The great increases in numbers of women workers, as well as their inexperience in the war industries in which they were employed under especially difficult conditions, led to a notable rise in accidents. Further, women's jobs were increasingly in the heavy and more dangerous processes, a development that contributed in considerable degree to the rising accident rate. Over three-fourths of the total increase in accidents to women from 1938 to 1942 occurred in five major war industries: Heavy metals, engineering, machinery, light metals, and aircraft. Women's accidents in these five fields numbered nearly 47,000 in 1942, in contrast to fewer than 3,000 in 1938. Women in British factories experienced over 71,000 accidents in 1942, one and two-thirds times the number in 1941 and nearly five times those in the pre-war year of 1938. Sickness absence, on the other hand, generally was higher among women than among men. The importance of the health of women workers to sustained national production was recognized in 1942 by the Select Committee on National Expenditure (originally appointed in 1939-40 to examine expenditures for war purposes) in a report on their health and welfare in war plants. Pointing out that little attention seemed to be paid either to constructive suggestions in technical reports or to results of experience, the committee stated that ". . . . There is still a heavy and often quite unnecessary loss of working time through the neglect, not only of the special needs of women but of elementary rules of health and welfare. . . . Many of the problems arising in Royal Ordnance Filling Factories today were exhaustively dealt with in a report on a Scottish filling factory issued toward the end of the last war, and yet there are no obvious signs that, when the factories required in this war were being brought into production, those responsible had assimilated and profited by the results of earlier experience." Factory medical and welfare arrangements were fostered by an order issued in July, 1940. In 1942 personnel available for medical supervision in industry included several thousand state registered nurses in industry, 150 whole-time and 582 part-time doctors employed by factories, and nearly 2,000 factory surgeons appointed by the government to examine on a fee basis juveniles and workers in hazardous processes. A point of special interest was brought out by British experience in regard to the use of women on heavy work. From a survey of heavy industries such as iron and steel, chemicals, and shipbuilding, the Ministry of Labor concluded that no different standards of health need be a setup for women, though adequate facilities were essential, stating: "It is considered that a normally healthy woman can undertake any of the jobs which have been designated as suitable for women, subject to special selection having to be made in cases where a woman is to be employed on particularly heavy work."

—From "British Policies and Methods in Employing Women in Wartime," by JANET M. HOOKS, in *Bulletin of the Women's Bureau*, No. 200, U. S. Department of Labor.

Music Helps You Work

THREE years ago the number of U.S. factories supplying regular programs of planned "work music" for their employees could be counted on the fingers. Today the American Society of Composers, Authors and Publishers estimates that nearly 25% of the 8,500 U.S. manufacturers with a capitalization of over $500,000 use music as a background for work in their plants. Some experts believe that 75% of the nation's 120,000 factories will install music systems when priorities are removed. Banking on continued demand after the war, record and sound-equipment manufacturers, agencies providing "piped-in" music over telephone wires to industrial plants, and firms making public-address systems are investing large sums in technical research. Music had been proved a definite aid to British production and morale under long hours and monotonous work. When the U.S. war-production program got under way, many plants in this country saw in the British experience a means of boosting morale and installed music-reproduction systems. The results have been phenomenal. Properly programmed to serve as a background for factory and office work, music increases the quantity and quality of production, relieves fatigue and nervous strain, reduces accidents, lowers labor turnover, and serves as a "bridge" between home and factory life for workers. Mr. R. W. Roddy of the Federal Cartridge Corp., operators of the Twin Cities Ordnance Plant of Minneapolis, Minnesota, estimates that for every dollar invested in work-music programs $84 has been saved. Con-

When a lot that's in the lunch

IS SHORT ON PUNCH!

Many a worker's lunchbox, as you know, is long on bulky, filling foods but short on essential vitamins.

Vitules are multi-vitamin capsules that provide effective supplementary vitamins. Each capsule supplies, in balanced ration, vitamins established as essential to maintain optimum health.

Most important of all, the improved **Vitules** formula makes each capsule so highly potent it provides *optimum* rather than *minimum* daily requirements . . . so highly potent it provides all known daily vitamin requirements *independent* of diet. The improved **Vitules** formula is based on the *Recommended Dietary Allowances* of ALL essential vitamins established by the Food and Nutrition Board of the National Research Council for the moderately active adult male.

Vitules provide in a daily dose (one capsule) the following potencies:

Vitamin A	5000 U.S.P. units
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Ascorbic Acid	75 mg.
Thiamine hydrochloride	2 mg.
Riboflavin	3 mg.
Nicotinamide	20 mg.
*Pyridoxine	2 mg.
*Calcium pantothenate	20 mg.

*Factors for which daily allowances have not been suggested.

To stabilize the vitamin A in **Vitules** mixed tocopherols equivalent in biologic potency to 3 mg. synthetic alpha tocopherol is added.

Packages of 30 and 100

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POWERFUL OPERATING LIGHT
To see clearly—instantly—accurately—without strain: What a vital necessity in surgery, in examinations involving body cavities, and in correct diagnosis! Pelton E & O Surgical Light is the modern answer to this vital need. It provides shadowless light entirely without heat or glare, of correct quality for accurate tissue diagnosis, and its concentrated intensity is also adequate for many surgical operations and cavity examination requiring deep penetration. Flexible, solidly constructed, finished in hospital gray Duranite, with chrome trim. Floor Stand Type, Eastern zone, $52.50, Western zone, $58.00. Wall Type, or ENT Unit Type, with flexible arm, Eastern zone, $76.00, Western zone, $79.50.
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trolled tests over a seven-month period at the Twin Cities Plant showed an 8,494 man-day saving. In one controlled experiment, music was played for a month and then shut down for a week. This resulted in an 18.5% decline from production accompanied by music. Another experiment showed a 34% decrease in the absence rate after music was installed. Music was discontinued three times for a total of 11 days in a six-months' period, and 1,002 unsolicited requests were made for its renewal. Similar results were obtained by the Sperry Gyroscope Co. Eighty per cent of the employees in Sperry's Long Island and Brooklyn plants had never worked in a factory before they came to Sperry. More than 50% were women. Although Sperry has no test figures on production results, its personnel officers say that before music was installed, many trainees, especially women from offices and homes, quit during their training period. But after the regular music programs began, more employees stayed on until they had made the adjustment to factory work. Sperry also credits its program with helping to reduce absenteeism and contributing to plant safety. The playing of marches at the end of each shift has resulted in a more orderly procession to the time clock and less pushing and shoving of workers in haste to leave the plant. Experience has shown that about two and a half musical hours out of an eight-hour shift give the best results. Selection of pieces is important. *Deep in the Heart of Texas* is out because the workers stop to clap hands in the chorus. The national anthem is not played in the middle of a shift because the employees must drop their work and stand at attention. A little jitterbug music is all right for variety, but too much of it may result in nervous tension. Pieces with tricky instrumental effects or abrupt changes of key should also be used sparingly; the same is true of vocal numbers. Clerks adding up figures in the accounting department will find that a background of salon-type music helps concentration, while workers on a noisy assembly or monotonous inspection line will want more lively waltzes and hit tunes. One plant in Cleveland employing hundreds of Poles has discovered that polkas are fine for morale.

—From "Business at War," in *Fortune*, August, 1944.

No Substitute for Label Reading

THERE is no substitute for label reading. Casualness in prescribing, administering or ordering drugs and medicines is indefensible. Physicians and nurses should be taught how to read labels. Now comes Current Comment in the *A.M.A. Journal*, headed by "Safety in Prescribing by Units." It says, "One cause of many accidents is the common practice of prescribing containers instead of units. Thus, the intern and the nurse are instructed to give 'one ampul' instead of a prescribed number of grams or milligrams expressed in percentage if the drug is in solution." This comment points out the startling fact that ampuls contain different amounts of medicinal substances. It should have mentioned tablets, capsules, bottles, boxes and barrels. It winds up with the statement that "the adoption of routine prescribing with proper terminology is strongly urged if accidents following mistakes in use of drugs are to be minimized." Attention is called to the use of the word *routine*. The writer of this comment is undoubtedly sincere, as are so many other uninformed physicians, health departments, and hospitals who think that colored solutions, colored, hexagonal, or other special shaped containers will prevent accidents. Nothing will take the place of label reading. Physicians, nurses and all who handle drugs should be taught by a pharmacist to read labels. A pharmacist should be in charge of all drugs in all places. Pharmacy faculty members should teach prescription writing; and how to read drug labels, in all medical and nursing schools, and to interns in hospitals. Those who handle and prescribe drugs must be taught not to

45% ATE NONE

"Where there is a deficiency of one vitamin there is usually a deficiency of others as well . . ." A daily serving of tomatoes will supply about ⅔ of the daily minimum requirement for Vitamin C, 850 I. U. of A., 11 mg. of Calcium, 27 mg. of Phosphorus, and 0.6 mg. of Iron. Yet according to a nation-wide poll *45% of those interviewed had had no tomatoes, citrus fruits or juices, raw cabbage or salad green*[1].

The Vimms Formula (3 tablets) supplies full minimum requirements for all the vitamins known to be essential in the diet, and significant quantities of Iron, Calcium and Phosphorus.

RECOMMENDED MULTI-VITAMIN BALANCE*	VITAMIN	VIMMS FORMULA (3 tablets)
4,000 USP Units	A	5,000 USP Units
1 mg.	B_1	1 mg.
2 mg.	B_2(G)	2 mg.
600 USP Units	C	600 USP Units
400 USP Units	D	500 USP Units
10 mg.	P-P (Niacin Amide)	10 mg.

In addition, Vimms supply the minerals most frequently deficient in the average diet.
CALCIUM ..... 375 mg.
PHOSPHORUS ..... 250 mg.
IRON ..... 10 mg.
*Journal of the A.M.A., July 18, 1942, pp. 948-9

NO PRODUCT which offers its formula in one tablet or capsule per day contains all the minerals and vitamins offered in Vimms. Potencies are chemically and biologically controlled. Tests on human subjects show that the vitamins are readily available for absorption. The tablets are palatable; can be chewed or swallowed.

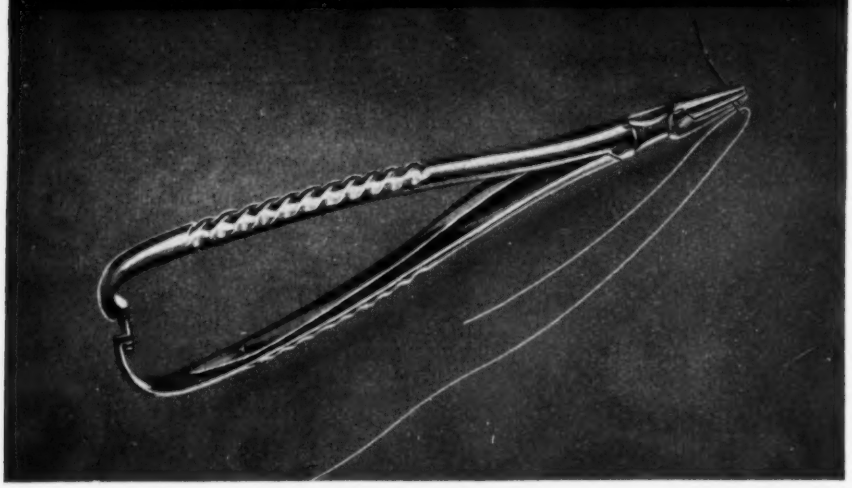
* * *

For professional samples write to Pharmaceutical Division, Lever Brothers Company, Department IM-02, Cambridge, Mass. (*Offer good in USA only.*)

[1] *Jl. of the American Medical Association, February 27, 1943.*

50¢ for 24;
$1.75 for 96; $4.50 for 288

Emergency Sutures



• When industrial surgical emergencies arise the surgeon needs dependable sutures. Available to you in the Ethicon line is a broad assortment of Emergency Sutures, equipped with open eye, cutting point needles. Sterile, in Boilable Tubes.

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be casual about them. The physician must be taught not to tell a patient to "just go buy a name and take it according to directions." He must be taught the dangers connected with drug prescribing and drug administration; and the physician must assume his responsibility in the matter.

—*N. A. R. D. Journal*, July 17, 1944.

No Bandwagon Too High

THERE is a well-developed tendency on the part of many academic minds in government bureaus to hit upon a well-established fact and then dish it out as something new that would have remained undiscovered had it not been for the keen perception of these erudite gentlemen." That is the reaction of Harry L. Sain, superintendent of the Division of Safety and Hygiene, Industrial Commission of Ohio, expressed in the *Ohio Industrial Commission Monitor*, to a report of the War Production Board which infers that mechanical safeguarding and safety equipment in industry were practically unknown until Pearl Harbor and were "discovered" by management under the prodding of Federal agencies. As Mr. Sain points out, this obviously is not true as for years management—at least in Ohio—in cooperation with safety engineers and government agencies in Ohio has been aware of the importance of safety equipment, has encouraged its general use and has established sound safety programs in thousands of plants, big and little, in this state. This is just another example of the attitude displayed by Washington bureaucrats that no bandwagon is too high for them to board and to take unto themselves the credit for a lot of things which were being done—and effectively—before their conception. For example, long before the New Deal or the Social Security Act, Ohio had an efficient crippled children's program and a good maternal and child health program; it provided relief for the blind; and general public health services were carried on in a satisfactory manner. Now that the Federal government has elbowed its way into these fields, Washington would like to have the public believe that it is the Moses which led the states out of the wilderness. True, the Federal government has given valuable assistance. Frequently, it has gone too far. We recognize the good things which Washington has accomplished by aiding the states when assistance was indicated and necessary, but we, too, are fed up with the growing attitude on the part of Federal agencies to take undeserved credit and to inject themselves into activities which are the responsibilities of each state and can be administered by existing departments of each state government. As Mr. Sain curtly puts it: "The tendency to insinuate that the effectiveness of these measures is contemporary with the advent of the current political dynasty is, to say the least, somewhat tiresome."

—*Ohio State Med. J.*, August, 1944.

A Separate Profession

DR. VICTOR G. HEISER, consultant to the National Association of Manufacturers, wrote in the *Connecticut State Medical Journal*: "Too many doctors still believe that industrial medicine requires no special preparation and that it can be practiced with the left hand, as it were, while with the other they continue their private practice. I assure you this cannot be done. The practice of industrial medicine is a separate profession and one which requires special training if industry is to receive the benefits which it has the right to expect. The education of the industrial physician today includes, in addition to his regular training as a doctor of medicine, such subjects as the engineering of ventilation, lighting, heating, and sanitation. He must have a knowledge of the ingredients and disease-causing qualities of the materials and processes used in the industrial organization. He must have a knowledge of plant sanitation problems and their solution, of working conditions, of accident and occupation disease prevention methods, and of preventive health measures in general." DR. RUTHERFORD T. JOHNSTONE said almost two years ago in the *Journal of the American Medical Association* that if a doctor is to obtain an adequate conception of the dissimilarity between general medicine and industrial medicine, he questions: "What are the signs and

Breakfast and Industrial Performance

The importance of an adequate breakfast for the industrial worker has been demonstrated in two recent investigations reported in the medical press. One, showing an increasing incidence of nutritional anemia among workers,[1] justifies the thought that breakfast—usually the neglected meal—in many instances may be the culprit. The second[2] directs attention to the higher incidence of accidents when the morning meal is inadequate.

Thus the widely advanced suggestion that breakfast should provide from ¼ to ⅓ of the day's total food requirement is again substantiated.

A recommended basic breakfast pattern consists of fruit, cereal, milk, bread and butter. If more is required, suitable foods are easily added.

The contribution made by the dish of cereal suggested is evidenced by the appended table. When 1 oz. of cereal (whole-grain, enriched, or restored to whole-grain values of thiamine, niacin, and iron) is eaten with 4 oz. of whole milk and 1 teaspoonful of sugar, this palatable combination of cereal (ready to eat or to be cooked), sugar, and milk contributes protein of high biologic value, readily utilized carbohydrate, well-emulsified fat, B-vitamins and minerals:

Calories	**205**
Protein	**7 Gm.**
Carbohydrate	**33 Gm.**
Fat	**5 Gm.**
Thiamine	**0.18 mg.**
Riboflavin	**0.30 mg.**
Niacin	**0.84 mg.**
Calcium	**0.16 Gm.**
Iron	**1.29 mg.**

1 Editorial: Iron Deficiency in War Time, Am. J. Digest. Dis. 11:94 (Mar.) 1944.

2 Mann. J.: Analysis of 1009 Consecutive Accident Cases at One Ordnance Depot, Indust. Med. 13:368 (May) 1944.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

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The same simple technique used in testing with Galatest (the dry reagent for the immediate detection of urine sugar) is also employed for the acetone test.

Acetone Test (Denco) detects presence or absence of acetone in urine in one minute. Color reaction is identical to that found in violet ring tests. A trace of acetone turns the powder light lavender—larger amounts to dark purple.

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symptoms attributable to the illness allegedly arising from the occupation of a furrier, fumigator, sand blaster, welder, maker of felt hats, abrasive soap maker, cotton sorter or degreaser (textile); from employment with refrigeration, vulcanizing or photography, or from working with rayon, benzene, cement dust, carbon disulfide, carbon tetrachloride, aniline dyes, pottery, chromium or methl chloride or with solutions used in electroplating, glass etching or dry cleaning?"

—From "Business Today," Marlow and Zielke's column in *Providence, R. I., Bulletin.*

Carbon Tetrachloride Poisoning

ALICE STEWART and L. J. WITTS, in discussing chronic carbon tetrachloride intoxication under a grant by the Medical Research Council, come to the following conclusions: "(1) A detailed examination has been made of workers at a factory in which exposure to carbon tetrachloride was heavy and persistent owing to wartime difficulties of ventilation. (2) Over a period of two-and-a-half years more than half of the workers had been discharged or transferred to other employment on account of symptoms attributed to carbon tetrachloride poisoning. (3) Evidence of hepatic or renal damage was rarely obtained. The characteristic symptoms were mental hebetude and gastro-intestinal upset. (4) Investigation of the gastro-intestinal tract by fractional gastric analysis, radiography and gastroscopy, showed gastric hypersecretion, and hypermotility with accompanying irritability and irregular contraction throughout the alimentary tract. (5) No visual effects were detected. (6) The symptoms cleared up in a few days or weeks after removal from exposure, though some disturbance in the alimentary pattern might remain for some months. (7) It is suggested that both the mental hebetude and the gastro-intestinal upset are due to the action of carbon tetrachloride on the central nervous system."

—Industrial Health Section, *Illinois M. J.*, July, 1944.

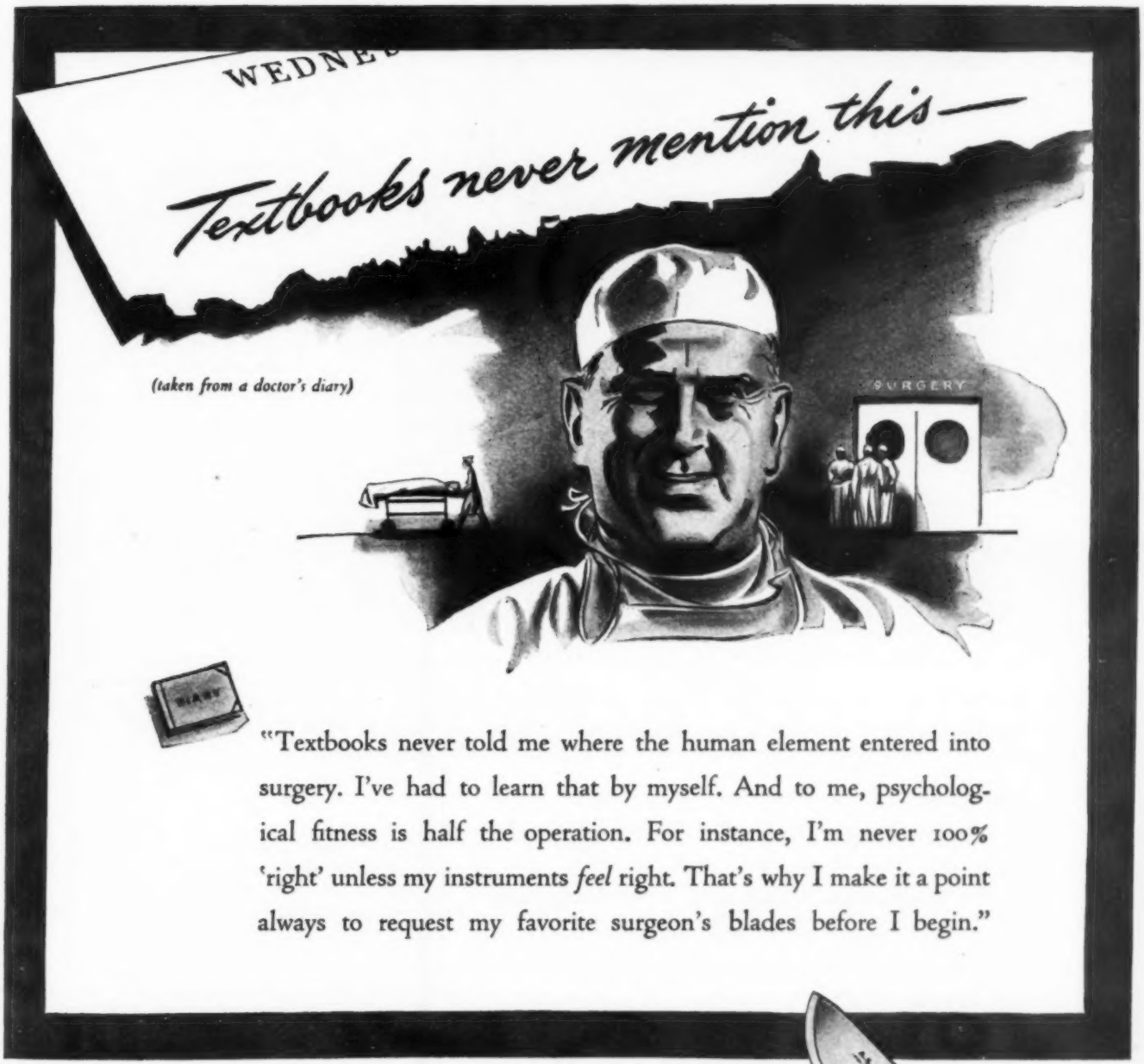
Security

FOR SOME time now in these columns I have been fighting words —particularly words that are designed to confuse and bluff us. For instance, such a phrase as "social security" means nothing at all. There can be some security for an individual through his own efforts and some for a family through the labors of its breadwinner. But there can be no absolute security for anyone, as millions of human beings have learned in the course of this war. But it is not war alone that makes for insecurity. Life makes for uncertainty and insecurity. Every act, every event in life, from conception to death, makes for uncertainty and insecurity, and it is that more than anything else which stimulates thinking and planning and work and ambition. I realized this most keenly the other day when it was frightfully hot up here in the woods. Suddenly, almost without notice, a storm appeared, felling corn to the ground, knocking down the phlox which we had so painstakingly designed, throwing an oak limb on the telephone wire and putting that instrument into disservice for 27 hours, filling the brooks, flooding our roads. Nature is little concerned with plans and purposes. It goes its own way. The storm passed in an hour and the damage was done. Life is precisely like that. The thing that is called "social security" is really compulsory government insurance through a payroll tax. It is all right for those who possess neither the intelligence nor the thrift to provide for themselves and their families. But it is not security. It is, in fact, dependence upon the well-being of the state and the value of the currency of the country. Germany instituted such compulsory state insurance under Bismarck and it was administered competently, but today it amounts to nothing and provides no security because Germany is insecure and the German Reich, which guaranteed the securities, is broke.

—GEORGE E. SOKOLSKY, in "These Days," in *Chicago Herald American*, August 21, 1944.

Diagnosis Limitations

IT IS ALWAYS important to recognize the limits of both physical examinations and instruments of precision. A colleague of mine a few years ago was very much incensed at the basal metabolic apparatus because it did not tell him which thyroid patients were going



"Textbooks never told me where the human element entered into surgery. I've had to learn that by myself. And to me, psychological fitness is half the operation. For instance, I'm never 100% 'right' unless my instruments *feel* right. That's why I make it a point always to request my favorite surgeon's blades before I begin."

No, textbooks never talk about surgeon's blades—but doctors do; and more times than not their choice is A. S. R. Surgeon's Blades. Correctly keen, highly uniform, perfectly balanced, A. S. R. Surgeon's Blades are considered "as sure as the surgeon's hand".

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THE ENDERMIC METHOD OF BRINGING RELIEF

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The kaolin base allows slow, even absorption of the contained antifebrile agents. There is therefore no shock but a gradual and sustained therapeutic effect.

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to survive operation and which were not; and he was threatening to give up its use altogether. I finally persuaded him not to, by pointing out that the basal metabolic apparatus was not a surgical oracle which answered questions of surgical mortality, but simply an apparatus to do what it was intended to do, namely, to estimate the basal metabolism and nothing else. There is a great tendency at the present time in medicine to exalt what seems exact, and to cry down what is obviously inexact. No one, however, appreciates the errors and inexactitude of instruments of precision more than those who work much with them. Medicine, we all know, in spite of great advances, is not a very exact science and probably will never be. Although when compared with psychology or with psychoanalysis it may seem extremely exact, yet it is very inexact compared with such sciences as mathematics, and even physics and chemistry. The thought I wish to emphasize is that correct diagnosis is the sum total of all the evidence at hand, and is not, as a rule, obtained from any one method of procedure, even when instruments of precision are employed. Instruments of precision are very desirable and at times very necessary, but thousands of correct diagnoses are made daily and hundreds of thousands of patients are healed without their employment. During the present emergency we should cultivate, as students and practitioners, simple methods of diagnosis. We cannot be sure that we will always have with us, on land, on sea and in the air, the electrocardiograph, the x-ray and the chemical laboratory. We can, however, be reasonably sure that while we function as physicians, we will be in possession of our five senses. Under such conditions we will realize our helplessness if we have leaned too heavily on instruments of precision in making our diagnoses.

—Ralph H. Major, M.D., in "The Diagnosis of Disease Without Instruments of Precision," in *New Orleans M. & S. J.*, August, 1944.

The Panel System in England

I am very proud of my professional liaisons here. The upper crust of British medicine is fully equal to ours, though the general average may not be quite as high. Incidentally, I have never met an English man or woman who is a member of a panel. My secretary, who is typing this letter, does not even know what it means. The panel system apparently, is that in which a few poor-salaried doctors take care of a large practice of indigent and ignorant patients. You insult any Englishman by asking him if he belongs to a panel. Beveridge or no Beveridge, this country is going to practice private medicine after the war, and up to now, if we admit that compensation work is 'state medicine' at home, England has less state medicine than the United States. Intelligent people in Great Britain insist upon selecting their physicians, and always will." The writer of the above, whose name we omit for military reasons, is no casual or fly-by-night observer, but a Rocky Mountain physician of highest attainments, who has known Britain in peace and through two wars. We prefer his word over that of some of our professional uplifters in Washington who would have us believe that for Englishmen generally the sun rises and sets in the so-called panel system of politically managed health insurance.

—*New York State J. Med.*, quoted in *West Virginia Med. J.*, August, 1944.

Illnesses of Convenience

The Bureau (Census) maintained an average of 3,248 employees at Suitland, Maryland, during 1943. Approximately 80% were women. The average employee was away from work on sick leave 6.1 times for a total of 11.1 days during the year. The average absence on sick leave was 1.8 days. There is no indication that the institution of the sick report system resulted in a reduction in the total sick leave taken by Bureau employees. Complete data concerning sick leave taken by Bureau employees prior to 1943 is not available, but incomplete figures in-

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The concept of human maintenance is more important today than ever before. One kind of human maintenance is the assurance of an adequate vitamin intake.

Nutritional studies have shown repeatedly that large numbers of industrial and office workers are subsisting on less than optimal amounts of vitamins. Faulty eating habits, rationing, dietary caprices and losses in cooking account for this condition.

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Vitamin D	800 U.S.P. units
Niacinamide	25 milligrams
Calcium d-Pantothenate	2 milligrams
Vitamin B_6	100 micrograms

INEXPENSIVE— Pan-Concemin Tablets are available to industrial physicians in stock packages of 1000 tablets or in individual dispensing units to suit any requirement. Employe groups can be given this high potency supplement at a cost of less than 2¢ a day per employe.

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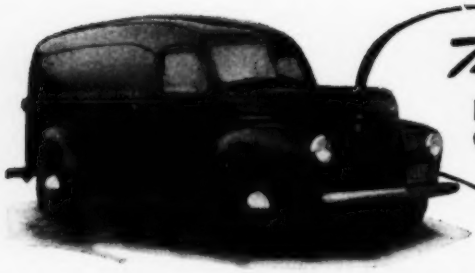

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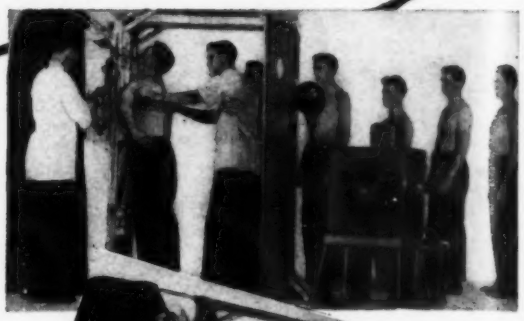

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dicate that there has not been a drop in total sick leave. This may be due largely to the fact that approximately 40% of leave taken as sick leave during 1943 and investigated by the "sick report nurse" was not due to actual illness in the traditional medical sense, but was connected with such varying factors as lack of security at home or at work, poor work habits, and personal problems. Since such illness, which may be considered illness of convenience, varies in accordance with a number of non-medical influences, a drop in the occurrence of actual illness which may have occurred because of the institution of the sick report system and the benefits derived therefrom could have been masked by the large amount of sick leave taken for reasons other than real illness. Of interest was the finding of regularly recurring reductions in total Bureau sick leave which coincided with the semimonthly paydays. The curious drop in illness on paydays is marked not only by its consistency, but by the fact that the decrease is almost constantly around 40%. The average daily loss in man-days because of sick leave during 1943 was 3.6% of the total available man-days, but the average loss on paydays was only 2.2%. This fact is stressed, because the estimated figure of 40% probably indicates the amount of sick leave taken by employees for illnesses of convenience.

—From "Evaluation of a Sick Report System," by LEON SCHWARTZ, M.D., in *Personnel Administration*, June, 1944.

The Circumstances of Life

MANY of the mental and emotional changes manifested in elderly persons are due less to aging and regression of their mental faculties, than to the kind of life forced on them by a heedless society. Lawton has pointed out that economic and social insecurity play a large part in hastening mental deterioration in older persons. A man who has worked most of his life, who has supported and brought up a family, who has regarded himself, if he ever gave thought to the matter, as a useful member of society is suddenly without work and without income for reasons of age alone. In spite of his best efforts, current concepts and customs make it impossible for him to obtain employment and maintain his independence. He becomes dependent on his children or on society. He learns that he has no further function in life, yet instinctively he clings to life. Is it not to be expected that this change in his status, forced on him by the workings of the culture of the society within which he lives, rather than by any cause residing within himself, should color his mental and emotional reactions? And since this same pattern is repeated in multitudes of members of our society, and since they react in similar ways, the unwarranted conclusion has been drawn that many of the mental and emotional characteristics of the aged are caused by intrinsic biologic changes, instead of recognizing that they are the result of external conditions imposed on them by the cultural pattern of the society within which they live. The validity of this view is strengthened by the repeated observation of intellectual vigor, and emotional balance in individuals who have passed the eighth decade in life, and who because of certain fortunate circumstances are enabled to continue lives of financial independence, and intellectual or creative productivity.

—ERNEST P. BOAS, M.D., in "Physiologic and Clinical Phenomena of Aging," in *New Orleans M. & S. J.*, August.

A.C.S. Congress Cancelled

THE AMERICAN College of Surgeons, upon action of its Board of Regents, has cancelled its 1944 Annual Clinical Congress because of the acute war situation that has developed, involving greater demands than at any time in the past upon transportation systems for the carrying of wounded military personnel, troops, and war materiel. The Congress was to have been held in Chicago, October 24 to 27. DR. IRVIN ABELL, of Louisville, Chairman of the Board of Regents, in making the announcement, said this action was taken after consultation with Washington. *—Continued on page 744.*

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CUT-RAK ADHESIVE DISPENSER

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No more hunting for scissors, no more tearing tape. Unroll one or more widths of plaster at one time, and slide cutter across track. Cut plaster stays on rack until ready for use. One hand operates it, leaving the other free to hold dressing in place. Cutter works in both directions. Bard-Parker #11 plain or ribbed-backed blades are easily replaceable. White enameled case closes when not in use.

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CURRENT ARTICLES of QUALITY

Industrial Code of Ethics

DR. E. S. JONES, Hammond, Indiana, "Industrial Medicine in Action," in *J. Indiana State M. A.*, August, 1944 (37: 8, 397-399). Extract: "Being more familiar with industrial medicine and its relationship to the general practitioner in Lake County, I shall give you first the industrial code of ethics as set forth by the Lake County Medical Society, of the State of Indiana. The preparation of this code was begun in 1940, but it was not adopted until 1942. *Relationship between Industrial and Private Physicians*: It is appreciated that no laws, rules, or regulations can be made that will apply equally to all. No rules can displace common sense and good judgment. In order that we may more nearly approach the Golden Rule in the relation between industry, labor, and the medical profession, the following principles are submitted: (1) *Pre-employment examinations.* It is recognized that the physical examination of applicants for work is the prerogative of an employer; that the time and place of such examinations are matters within his jurisdiction; and that he must have free choice of the physician who is to make the examinations. The foregoing assumes that the employer pays the entire cost of the medical service rendered. The examining physician in this circumstance is performing a service for the employer, and has primarily the single obligation to further the employer's interest. It is recommended, however, that in the broader interest of the community he accept the following rules of practice: (a) Make available to the personal physician of an examinee a full report on the latter's examination; this to hold only in the event an examinee requests that a report be made. (b) Willingly consult with the examinee's personal physician when differences in opinion exist regarding medical findings. (c) Refrain from naming a practitioner to whom the examinee should report for correction of defects discovered in the examination.

(2) *Occupational diseases and injuries.* The treatment of occupational injuries and diseases is the direct concern of an employer, and the facilities and physicians provided by him for that purpose must remain within his discretion. The employer is best served in these instances by physicians and surgeons who observe the general rules of the ethics of their profession. Specifically, the following points of conduct are considered important: (a) It is not ethical for an industrial surgeon, while caring for an industrial injury or disease case, to urge the patient to have a concomitant and coincidental disease treated by himself at the worker's expense. (b) Once a case of questionable liability to the employer is diagnosed as being of non-occupational origin, the patient is to be referred to his personal physician for further care. (c) In general, a physician or surgeon is not to use his industrial affiliation as a direct means of gaining a private practice among plant workers. Emphasis is placed here on solicitation, low fee arrangements, and insinuation of reprisals against these workers who insist on care by physicians of their own choice. Companion obligations rest with non-industrial physicians and surgeons in these matters: When a private physician suspects the diagnosis of an occupational disease or injury in a patient, he should, with his patient's permission, communicate the information to the proper plant doctor. When differences of opinion exist as to the compensability of medical and surgical conditions, the private physician, with the permission of his patient, is to confer with the plant doctor. Statements to workers that occupational diseases or injuries were not properly treated accomplish nothing constructive, and in any case the expression of such opinions is to be withheld until there has been consultation with the plant physician for the purpose of ascertaining all pertinent facts. (3) *Health supervisory programs.* Health supervisory programs may be properly carried on by an employer's medical personnel, if the purpose of the program be any or all of the following: (a) To discover cases of occupational disease among employees exposed to known health hazards. (b) To diagnose all possible illnesses which may influence adversely the

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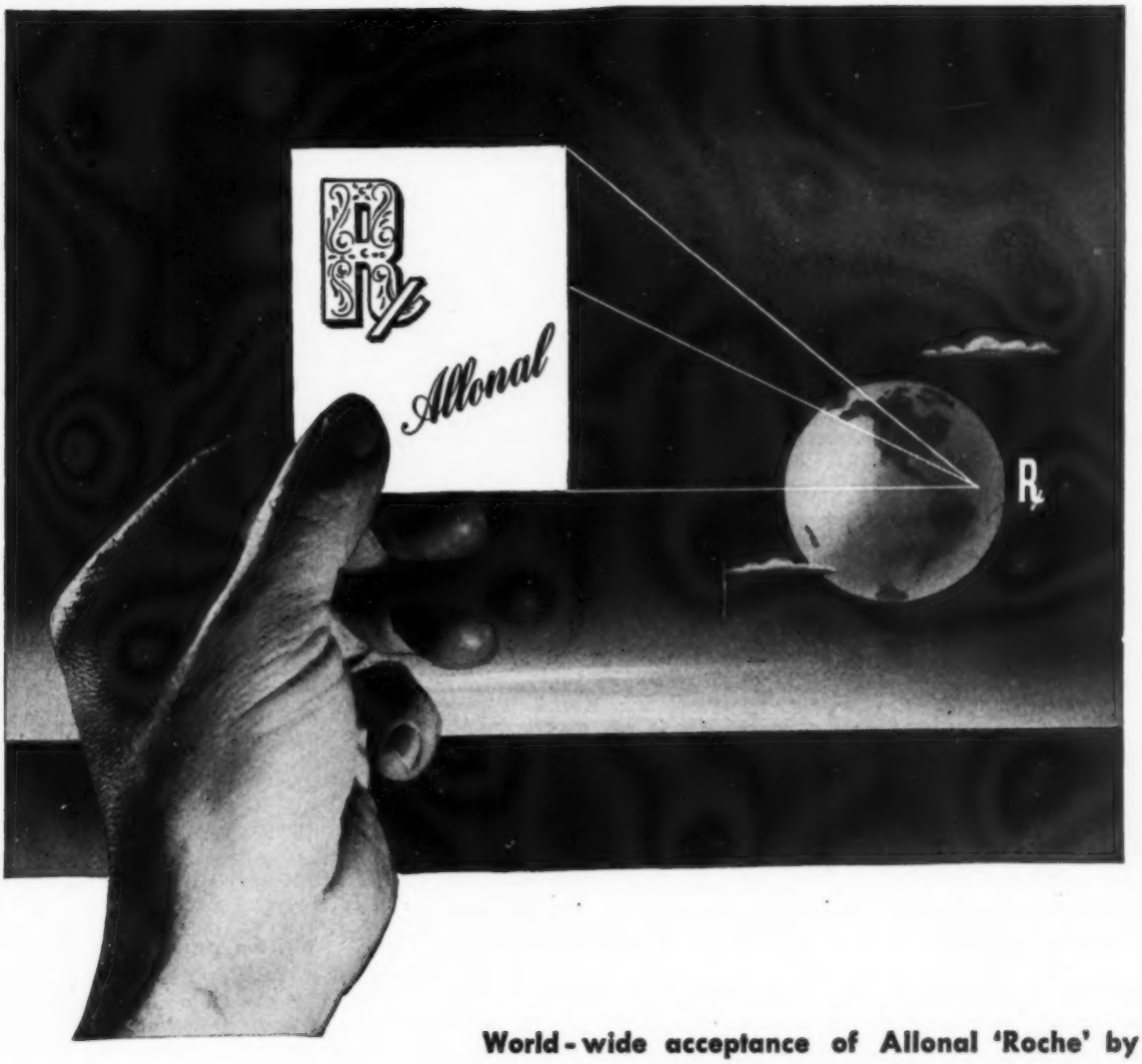

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earning capacity of workers or plant safety. (c) To determine if workers returning from sickness absences have recovered sufficiently to carry on their jobs without injury to themselves or endangering the safety of others. With respect to such programs the society considers certain ethical principles to be basic. They are: The results of clinical examinations must be made available to the personal physicians of the examined employee. No influence is to be brought to bear on employees in their selection of personal physicians for the correction of physical defects. No treatment for non-occupational diseases or injuries to be offered at the company's medical department, except in minor cases when enough treatment may be furnished a worker to make it possible for him to complete a turn of work with a minimum of injury and discomfort to himself. It is recognized that the plant physician is best qualified to judge a worker's ability to return to his particular job after an illness. In the interests of harmony in the medical community, however, when there is conflict of opinion in such cases between the worker's personal physician and the plant physician, the latter shall, at the request of the personal physician, consult with him on the case. (4) We recommend that all industries have doctors of their own choice, who are to act in the capacity of consultants, or as attendants, at plant medical departments. We believe records of the physical status of all employees are valuable as protection to both the employer and employee. (5) It is against the policy of the medical profession to have any free medical examinations in any industry for whatever purpose, unless having been first submitted to and passed by the council of the local medical society. We do believe in and encourage research work that may bring knowledge to the medical profession and benefit to mankind, but severely condemn the abuse of research for commercial purposes. (6) *Medical testimony before the State Industrial Board.* Any member of the Lake County Medical Society who has submitted expert medical testimony at a hearing before the State Industrial Board in a suit for compensation may petition the council to review all of the medical testimony submitted at that hearing. The petition must be made after a final decision in the case has been reached. The council will have discretionary power in the matter of deciding whether or not to review the case. Once the decision has been made to review the case, the council will make a reasonable effort to arrange a convenient time and place for the review. All of the physicians who submitted testimony at the hearing in question will be apprised of that time and place, and must be permitted to attend the review. The society has the duty to censure any of its members for apparently flagrant deviations from the society's standards of competency and honesty, as revealed in such a review."

Written Standing Orders

COMMITTEE on Industrial Health of the Ohio State Medical Association, in *Ohio State M. J.*, August, 1944 (40:8,774-775), under the title "Providing Industrial Nurses with Written Standing Orders is a Vital Responsibility of the Physician": "Last November the Committee on Industrial Health of the Ohio State Medical Association published in the *Ohio State M. J.* an outline, 'Fundamentals in the Organization of an Industrial Health Program by a County Medical Society.' The reception accorded this material and the interest it aroused have been gratifying. Hundreds of copies of the pamphlet have been distributed. One chapter in this outline was entitled, 'Legal Responsibilities and Limitations of Nurses and Lay Personnel.' Coincident with the publication of this material, the Council on Industrial Health of the A.M.A. published a pamphlet, 'Standing Orders for Nurses in Industry.' Numerous requests for the pamphlet on standing orders have been received both by the A.M.A. and the Ohio State Medical Association. It was reproduced in its entirety in the December, 1943, issue of *Ohio State M. J.* Discussions of standing orders for nurses have taken place at district meetings of industrial nurses and at their state meeting last May, demonstrating the interest which industrial nurses have taken and are taking in this subject.

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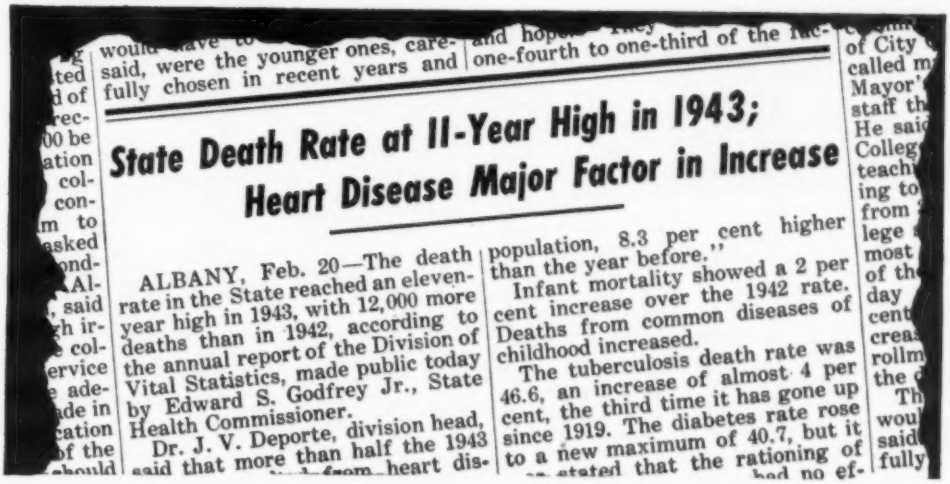
While some plants have had written standing orders for some time, numerous others have compiled them as a result of this new general interest in this subject. The Committee on Industrial Health of the Ohio State Medical Association wishes to emphasize by means of this article its approval of the policy of standing orders for nurses—orders written and signed by the physician or physicians in charge of the medical activities in all plants. Medical care is the function of the licensed physician, and the licensed physician only. This statement is the essence of the Ohio law. Therefore, those assisting in the medical activities of a plant must have direct supervision and guidance from a licensed physician. It is conceded that most, if not all, civilian standards of service of all kinds have of necessity suffered during the war, either qualitatively or quantitatively. Qualitatively, industry has suffered through the depletion of so many skilled employes, but quantitatively industry's ranks have been swelled by hundreds of thousands owing to the demands of war production. This has led to an increased demand for more medical service in industry. Consequently many more industrial nurses have been employed to meet new demands for nursing services as a part of the over-all medical program. The medical profession on the other hand has suffered quantitatively. For example, more than one-third of Ohio's practicing physicians have entered the armed forces. Qualitatively, there has been no deterioration, as the standards of medical education and the requirements for licensure have not been lowered. In the older companies where medical service was already established and in many newer companies where judgment has been sound, nurses have been supplied with adequate medical supervision. In too many instances, however, nurses are expected to carry out their programs under lay supervision with little or no regard for the necessity of professional direction from a physician. This situation has developed due to the stress of war. There is danger of its being carried over into the era of peace by the momentum of precedent. True, the letter of the law may be stretched many times under the stress of war but it should be returned to its normal stage when the stress of war disappears. The vital point is: If the spirit of the law becomes too distorted by the strain of emergency, this distortion may become a permanent disfigurement. We know of no better method of emphasizing and maintaining sound fundamental principles relating to the practice of medicine and the practice of nursing in industry than the perpetuation of the long and well-established practice which requires the nurse to carry on her duties under written orders of a licensed physician. In the hospital this policy has become so thoroughly established that the mere thought of its abandonment would be greeted with consternation. It has served to protect the patient, the doctor, the nurse and the hospital. Only in so far as this practice is adopted in industry will the employee, the doctor, the nurse and the management be protected. The industrial nurses as a group have recognized the need for written standing orders and desire universal adoption of this procedure. Unfortunately there are no means by which the procedure for written standing orders can be simultaneously introduced into all industries. It is a step which must be taken individually by each plant with the approval and cooperation of lay representatives of management. If the nurse does not have the support of the physician in this demand for direction, her task becomes difficult, if not impossible. The support of medical societies is not sufficient to help the nurse win medical supervision. Each physician must meet his individual responsibility. It is essential that the licensed physician most closely identified with the medical activities in a plant give his support and assistance to the nurse or nurses employed by the plant. In other words, we emphatically recommend that each physician take a leading part in bringing about the establishment of a policy of written standing orders for nurses in all plants with which he has any connection. In the formation of sets of standing orders, the suggestions and assistance of the nurse can be of inestimable value because of her knowledge of special needs within the particular plant. The type of written order which may be used in industry will vary somewhat from that usually supplied the hospital nurse, where the order in most instances is specific for an individual patient. In industry the requirements consist of standing orders describing procedures applicable to the situation most likely encoun-



said, were the younger ones, carefully chosen in recent years and

one-fourth to one-third of the

State Death Rate at 11-Year High in 1943; Heart Disease Major Factor in Increase

ALBANY, Feb. 20—The death rate in the State reached an eleven-year high in 1943, with 12,000 more deaths than in 1942, according to the annual report of the Division of Vital Statistics, made public today by Edward S. Godfrey Jr., State Health Commissioner.

Dr. J. V. Deporte, division head, said that more than half the 1943

population, 8.3 per cent higher than the year before."

Infant mortality showed a 2 per cent increase over the 1942 rate. Deaths from common diseases of childhood increased.

The tuberculosis death rate was 46.6, an increase of almost 4 per cent, the third time it has gone up since 1919. The diabetes rate rose to a new maximum of 40.7, but it

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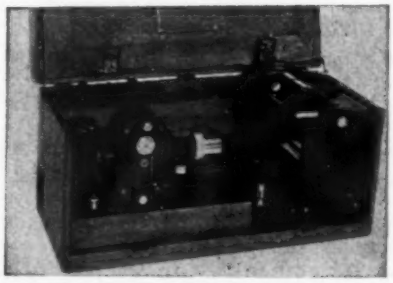

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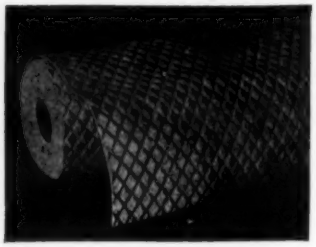

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tered. For that reason no one set of orders can be considered applicable to all industries in all communities. Individual variations will be desirable. The 'Standing Orders for Nurses' compiled by the Council on Industrial Health of the A.M.A. must be viewed in this light. They are not intended as a blanket mandate for all industries. They should be used as a general guide; tailored to fit the needs of the individual situation. It is likely that a collection of existing standing orders will be compiled in the near future. When and if this is done, there will be available a valuable collection of material for the physician who wishes to draw on the experience of others. The Committee on Industrial Health of the Ohio State Medical Association takes this opportunity to reaffirm its belief in the necessity of written standing orders for nurses and offers its active assistance in perpetuating sound principles in this, as well as other phases of industrial medicine."

Experimental Poisoning with DDT

DR. R. D. LILLIE, Senior Surgeon, and M. I. SMITH, Chief Pharmacologist, U. S. Public Health Service, "Pathology of Experimental Poisoning in Cats, Rabbits and Rats with 2, 2 bis-parachlorphenyl—1, 1, 1 trichlorethane," in *Public Health Reports*, July 28, 1944 (59: 30, 979-984). Summary and conclusions: "In spite of the pronounced neurologic symptoms histologic alterations in the central nervous system have been relatively slight. Vacuolation around large nerve cells in cord and cerebral motor nuclei has been seen in cats, rats, and rabbits; tigrolysis and cell vacuolation in cats and rats. The most striking pathologic alterations are seen in the liver. Here there is a hyaline degeneration similar to that described in poisoning by azobenzene and some of its derivatives. Hyaline oxyphil masses are formed in the central part of the cytoplasm and then are surrounded by vacuoles. This change has been seen in rats and rabbits. Also a variable amount of fatty degeneration of liver cells, often centrolobular, is observed in cats, rats, and rabbits. Midzonal and centrolobular areas of coagulation necrosis are found in cats, rats, rabbits, which in rats and rabbits is accompanied by an interstitial and peripheral proliferative reaction leading to replacement by a new vascular granulation tissue. With more extensive and confluent necrosis this replacement process leads to trabeculation. Finally there is seen also a focal hydropic degeneration of liver cells in rats and rabbits in which the affected cells may reach two to three times their normal diameter. Nelson reports lesions similar to these in his rabbits, rats, and guinea pigs. Muscle necrosis with proliferative reaction was seen in one of our rabbits, and has been noted also by Nelson in this species and in guinea pigs. He has noted also necroses of heart muscle in occasional rabbits and guinea pigs."

Chronic CO Poisoning

FRANK S. ROSSITER, M.D., Carnegie-Illinois Steel Corporation, Pittsburgh, "The Hazards of Carbon Monoxide," in *Medical World*, June, 1944 (62:6, 253-261). Extract: "At this point I would like to make a few remarks concerning the slow or chronic carbon monoxide poisoning. By chronic carbon monoxide poisoning is meant, the alleged effects produced by the inhalation of low concentrations of this gas over a long period of time, and should not be confused with the true after-effects sometimes seen following severe gassing where the victim has been unconscious for a long time. After a careful study and an extensive investigation, together with my personal observations over a period of 34 years, during which time over 3000 cases were treated, I do not believe that such a condition as chronic poisoning exists. No definite proof or convincing evidence has been given, and the leading authorities on the subject have not accepted it as a fact. Practically everyone admits the gas is non-toxic and that the effects are due to oxygen-want, but those who talk about chronic poisoning fail to take into consideration that there

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is no anoxia unless there is severe gassing and that the victim must be rendered unconscious. It is true that men exposed to small quantities of gas over a period of time attribute various complaints to the gas, but I have arrived at the conclusion that all their symptoms can be traced to some underlying condition; such as, errors in diet, unhygienic living, alcoholism, syphilis, bad teeth and tonsils, rheumatism, etc., which, when corrected gives immediate relief. Such symptoms complained of as headache, dizziness, palpitation, digestive disturbances, nausea, tired-out feeling, loss of memory, anemia, insomnia, general weakness, loss of sexual desire, constipation, etc., may result from many different causes. These symptoms cannot be distinguished from the symptoms of ill health which are generally associated with age and the nature of one's work. In making a diagnosis as to the cause of these symptoms, it is necessary to take into consideration many factors pertaining to work, life and general health. Work may compel a man to stand or sit all day; he may be subjected to excessive heat and humidity; the ventilation and general working conditions may be poor; he may be forced to work under artificial light; there may be extreme noise and vibration about him, and dust and other fumes may play some part. He may have marital or financial worries. Poor food, errors in diet, dissipation, unhygienic living are great factors, as well as bad teeth, bad tonsils, gout, rheumatism, exposure, syphilis, and alcoholism. When we consider all these things and our present knowledge of the mode of action of this gas on the human system, I believe the possibility of carbon monoxide causing any chronic condition is very remote. However, it must be remembered that contaminants in the gas may cause ill-effects. . . . . An article in *J.A.M.A.*, February 26, 1936, by Shillito, Drinker and Shaughnessy, reports an investigation of 21,143 CO cases in metropolitan New York, all severe enough to require hospitalization, in which only 43 had any after-effects. Of these 23 recovered, 11 died, and only nine had chronic after-effects, and all these effects were referable to the nervous system.

Postwar Health Education

HUGH B. ROBINS, Director, Calhoun County Health Department, Marshall, Michigan, "Planning for Health Education in the War and Postwar Periods—the Local Program," in *Public Health Reports*, July 21, 1944 (59:29, 938-942). Extract: "From reports of cases and deaths in Calhoun County over a period of years, it was learned that tuberculosis was concentrated in the industrial areas, and was most prevalent among the Negroes and foreign-born whites. A review of the facilities at hand revealed a county medical society, a county tuberculosis hospital, a county tuberculosis society, local hospitals, organized industrial group, school, and a State Bureau of Tuberculosis Control. The time-honored pick and hunt method of following up contacts to known cases had been used. In 1942, only 17% of the cases reported were in the incipient stage of the disease. After discussions with resource groups, it was decided that a chest x-ray was needed as a part of the industrial pre-employment examination, but talks with personal managers and labor leaders brought no results. It was then agreed that mass-surveying with a mobile x-ray unit was the next best thing. Areas of responsibility were set up in the group. The county medical society endorsed the plan and requested the use of the State Department's mobile x-ray unit. The county tuberculosis society conferred with labor and management, and set up a calendar for the unit. Labor unions held meetings and voted to cooperate. All original films taken by the mobile unit were read at the State Department of Health. All suspicious small (4 x 5) films were rechecked on 14 x 17 film at local hospitals. The local hospitals offered a special rate for this work and sent the films to the county hospital for reading. The tuberculosis society and the county health department divided the cost of these re-checks. Notifications for re-checks were carried out jointly by the personnel of the county

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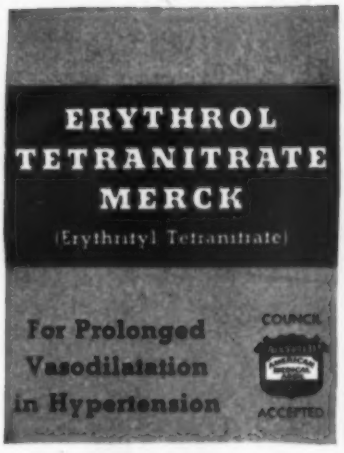

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health department, the county tuberculosis society, and the county hospital. The family physician were given copies of the reports of findings on the large x-rays, and, together with the director of the county hospital, made a decision as to necessary hospitalization of active cases found. The follow-up work was done by the public health nurses. In all, 13,000 persons were examined and 45 cases were found; of these 20 were minimal, 18 moderately advanced, and seven far advanced. While arranging for the mobile x-ray unit to invade the industrial area, the health department staff assisted with a general education program of lectures, movies, posters, and school programs, sponsored by the health department and the tuberculosis society in those areas. Further discussions with the part-time physicians working with industry have resulted in their arranging for five plants to include an x-ray in the pre-employment examination. This idea has been worked out by the physicians with the local hospitals of which they are staff members. At last one of our long-range objectives is being reached."

Cadmium Poisoning

LOUIS W. SPOLYAR, M.D., Director, Division Industrial Hygiene, Indiana State Board Health, Indianapolis, "Cadmium Poisoning in Industry," in *Factory Management and Maintenance*," July, 1944: "Because of a recent death from, and other cases of, cadmium poisoning in one of our plants, attention is again focused on the toxicity of cadmium. The absorption of cadmium fumes occurred when workers heated cadmium plated pipe with a blowtorch in order that one end could be flanged as the pipe was rotated in a spinning lathe. Exposures to the fumes varied from four to eight hours. Cadmium poisoning in industry invariably occurs from the accidental absorption of fumes or dust by way of the respiratory tract, and seldom, if ever, occurs by ingestion of cadmium compounds. The exposure is accidental in that someone along the line didn't know, didn't think, or didn't bother to find out that cadmium is very toxic and can produce death in about 15% of the cases exposed. To date, 59 cases of cadmium poisoning in industry have been reported. Of this group, there were nine deaths. The first report was by Sovet in 1859. Thus one can readily see that there have not been many cases through the years. However, an analysis of the case reports brings out one salient fact—that they were accidents. Unfortunately cadmium produces no immediate disturbing symptoms when it is inhaled. Thus the worker tends to stay on the job, tolerate the 'nuisance,' and all the while he is absorbing large quantities of cadmium. After two to four hours of inhaling cadmium, workers will complain of irritation of the nose and throat, a dry metallic taste in the mouth, a cough, and a headache. Usually they will not be nauseated unless they swallow some of the cadmium deposited in the mouth. Cadmium when swallowed will produce nausea and vomiting even if very small amounts are taken. For example, should a refrigerator ice cube tray be plated with cadmium and a citrus acid dessert be frozen in that tray, the dessert would absorb enough cadmium to produce violent vomiting for some three hours. Numerous cases of this type of poisoning have been reported, and it demonstrates that very small amounts of cadmium can produce severe gastric upsets. Further, this demonstrates that cooking utensils should not be cadmium plated. Following the development of the early symptoms discussed, namely irritation nose and throat, metallic taste, cough and headache, the workers may within eight to 12 hours develop chills that simulate brass chills. Twenty-four to 36 hours after exposure, the workers begin to complain bitterly about a severe chest pain and shortness of breath. Unless infectious complications occur in the chest, there will be no temperature. The symptoms given are all referable to the chest and are due to the chemical irritation of the lungs set up by the cadmium. This irritation, among other things, produces fluid in the lungs and thereby reduces the amount of oxygen delivered to the body. Thus, one sees clinically the shortness of breath and other symptoms suggesting damage to the respiratory tract. The exact cause of death is uncertain, but it is believed to be the decreased oxygen supply to the blood. Depending on the amount of fluid present in the lung, the heart reserve of the individual, and the complications, especially pneumonia, that may or may not develop, the patient may or may not die. It has been significant that of the deaths that have been reported, all occurred between the fifth

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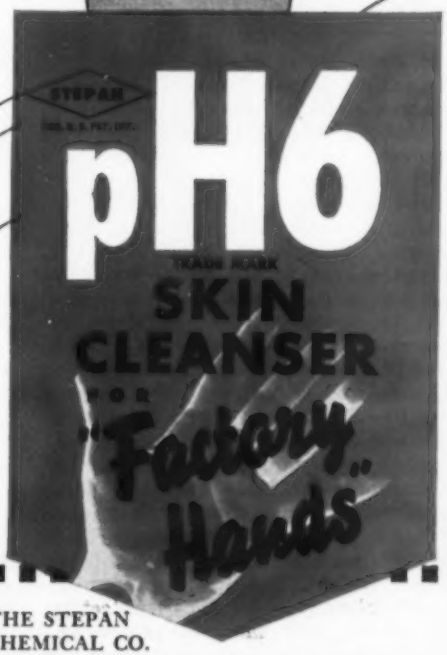
I SHOULD SAY IT IS! AND LOOK HOW CLEAR AND SOFT MY SKIN IS, NOW THAT WE'RE USING pH6.



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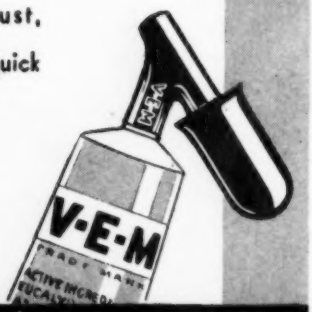

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and ninth day after exposure. Should the patient survive the ninth day, his chances of living are definitely good. Should he live, it appears that his recovery seems to be complete. We, as well as other investigators, have found that x-rays of the chest are normal after some four weeks after exposure. The men usually become symptom-free within two weeks. To prevent cadmium poisoning it is essential to remember that cadmium is extremely toxic and that no worker should be exposed to cadmium fumes in excess of 1 milligram of cadmium per 10 cubic meters of air. To achieve this end all burning, heating, welding, grinding, burring, or stamping of cadmium plated ware should be done under an efficient, well-designed local exhaust system. If the job is such that it can't be done by a fixed exhaust system, then the worker must be furnished respiratory protection by giving him the respirators approved by the U. S. Bureau Mines for cadmium. By being aware that cadmium can kill, it will be possible to prevent needless accidental deaths.

Dermatitis from Textile Finishes

LOUIS SCHWARTZ, M.D., Medical Director, Dermatoses Investigation Section, U. S. Public Health Service, "The Incidence and Prevention of Dermatitis from Textile Finishes," in *Textile Bulletin*, Charlotte, North Carolina, June 15, 1944. Text: "Some 10 years ago all cases of dermatitis claimed to be due to textiles were blamed on the so-called aniline dyes. The name aniline dye is really a misnomer because most of the dyes are not derived from aniline. It is far better to call them coal tar dyes or synthetic dyes.

"While it is true that some of the synthetic dyes are skin irritants and sensitizers, when we consider the fact that nearly everything we wear is dyed, then it is realized that the percentage of people who claim to develop skin rashes—from fabric dyes is almost infinitesimally small. On an average in normal years, less than 300 claims per year are made to manufacturers and stores that dermatitis is developed from wearing fabrics. This is far less a percentage than the number of people who develop rashes from eating strawberries, tomatoes, fish, etc.

"It was not until 1934 that dermatologists discovered that fabric finishes sometimes cause dermatitis. At that time, our attention was called to a case of dermatitis in a man who had bought a cheap pair of socks. The dermatitis involved all of the skin covered by the sock. It was first claimed by the man, and confirmed by his physician, that the dye as usual was the cause, especially since it bled. An examination of the socks showed that the body was made of rayon and dyed with many colors. The toe and the tops were made of cotton dyed black and yet, all of the skin touched by the whole sock was inflamed.

"This, to our mind, was not consistent with the fact that the dye on dyes was the cause of the trouble. Obviously, the dyes used on the black toes and tops were different from the many colored dyes used on the rest of the sock. We, therefore, began to look for a common chemical which was used on all the socks. We went to the manufacturer and found that a finish was used on the sock, and that this finish consisted of a sulphonated castor oil. Patch tests performed on the patient with the dyes, the fabrics and the finish, incriminated the finish as the cause of the dermatitis. The finish was traced to the manufacturer and it was found that the pH of the finish was close to 8.0. Further tests on the patient showed that he was highly sensitive to alkalies of any kind. Therefore, it was inferred that the alkalinity of the finish was the actual cause of the dermatitis rather than the sulphonated oil itself.

"This, of course, was an isolated case of alkali sensitivity and other similar cases were reported. At this time, sulphonated castor oil and starches were the principal finishes used on fabrics, and dermatitis rarely occurred among workers in dyeing and finishing establishments who ap-

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Breck Hand Cleaner is steadily making friends · It contains no soap or alkali and has been accepted by workers and management alike as being a prepa ration which really does help keep hands in good condition · We like to believe that this preparation has been a help in the war effort · We like also to believe that it has been helpful in the control of Industrial Dermatitis in War Industrial Plants · Already Breck Hand Cleaner is being used in the office and in the home · Breck pH7 Protective Cream and Breck Water Resistant Cream have also proved useful in War Industrial Plants

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The advantages of this fine Ille unit make it indispensable in every modern Physical Therapy Department for: (1) the after-care of fractures; (2) stiffness of joints; (3) scar tissue; (4) weakness or stiffness of hands, secondary to nerve lesions; and in (5) certain vascular diseases.

Special Features

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plied or came in contact with these finishes or among the wearers of fabrics on which these simple finishes were used.

"It was not until 1940 that our attention was again called to dermatitis from fabric finishes. At that time, we received a communication from a dermatologist in Canada that there was an outbreak of dermatitis occurring there among the wearers of certain cotton fabrics. In collaboration with this dermatologist, it was found that a certain finish used on these fabrics was the cause of the dermatitis. The finish was traced to its manufacturer from whom the ingredients were obtained. Patch tests with each of the ingredients showed that an ester gum was causing the trouble.

"About the same time, we began to receive reports of dermatitis occurring in the United States from certain cotton shorts and ladies' stockings, both nylon and silk, and from certain fabrics such as trousers, coveralls, etc. An investigation was begun, and you are all familiar with the results of this investigation which showed that the same finish that caused the dermatitis in Canada was the principal cause of the dermatitis resulting among the users of the wearing apparel.

"In the course of this investigation, we found that not only were the wearers of these fabrics affected, but that some of the workers in the factories where the finishes were applied were also affected with dermatitis which was directly traceable to this finish.

"It also developed during the course of this investigation that there were other finishes which contained various types of resins and that some cases of dermatitis had also occurred with these resin finishes. The urea-formaldehyde, malamine-formaldehyde, ester gum and methacrylate resin finishes were among those which were studied.

"As a result of this investigation, there was formulated and advocated a method of testing new fabric finishes for their skin irritating qualities before putting them on the market. Briefly, this method consists first, in testing the finish on animals to determine whether it is a primary skin irritant, and thus avoid its use on fabrics coming in contact with the skin. If found not to be a primary skin irritant, patch tests should be performed on 200 individuals with the finished fabrics to find out how many cases of dermatitis develop, and then repatch the same 200 subjects 10 days later to determine the skin sensitizing properties of the finish. These tests are to be compared with the results of similar patch tests performed at the same time, on the same subjects, using as a control an undyed, unfinished piece of fabric and a piece of fabric containing a finish which has long been on the market without causing any trouble.

"These tests have been carried out for the past two years by manufacturers, and there has been no similar outbreak of dermatitis occurring among the general population since that time, although new finishes have been developed and used.

"Since we have been in the war, we have had an outbreak of dermatitis among workers sewing a material on which a waterproof finish was being used. This was traced down to the use of Japan wax by one manufacturer. Japan wax is derived from a plant closely related to poison ivy, and has many times previously been the cause of dermatitis. It should not be used as a fabric finish; especially since other innocuous waxes such as paraffin, carnaba, etc., are available.

"Manufacturers of finishes have progressed a long way since the time that sulfonated oils and starches were used to give fabrics selling appeal. We now have creaseproof finishes, runproof finishes, crease retaining finishes, waterproof finishes, fireproof finishes, mildewproof finishes, fungousproof finishes, germproof finishes, and maybe I have left out a few more of which I am not aware. Anyhow, this is not the end; there will be more.

"The chemicals used for these finishes all have possibilities of causing dermatitis. The finishes which are

IN THE PROBLEMS OF *Contact Dermatoses*

Wide use in a large number of industrial plants during the recent past has established Tarbonis* as an excellent means of controlling industrial dermatoses (dermatergoses), virtually regardless of the offending irritant. It is highly effective not merely therapeutically, when the lesions have occurred, but also prophylactically.

According to Macleod,† the "first objective evidence of irritation to the skin is dilation of the blood vessels of the papillary and subpapillary layers, with slowing of the blood current and exudation of the leukocytes and plasma." These are exactly the conditions counteracted by the pharmacodynamic properties of tar.

Tarbonis is a tar preparation, presenting an especially processed Liquor Carbonis Detergens (5%), together with lanolin and menthol, in a special vanishing-type cream. It is odorless, greaseless, non-staining, non-soiling, and no removal is required before reapplication. It is antipruritic, decongestant, promotes dermic lymph circulation, and promotes resolution.

In plant after plant, the systematic, continuous application of Tarbonis has led to control of dermatergoses, apparently by interfering with the development of the initial stage of the reaction to the irritant.

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Physicians are invited to send for clinical test sample and the new, comprehensive brochure on tar therapy. THE TARBONIS COMPANY, 1220 Huron Road, Cleveland 15, Ohio.

†The Dermatergoses or Occupational Affections of the Skin, White, R. Prosser, 4th Ed., p. 22, H. K. Lewis & Co., Ltd., London 1934.
*Reg. U. S. Pat. Off.

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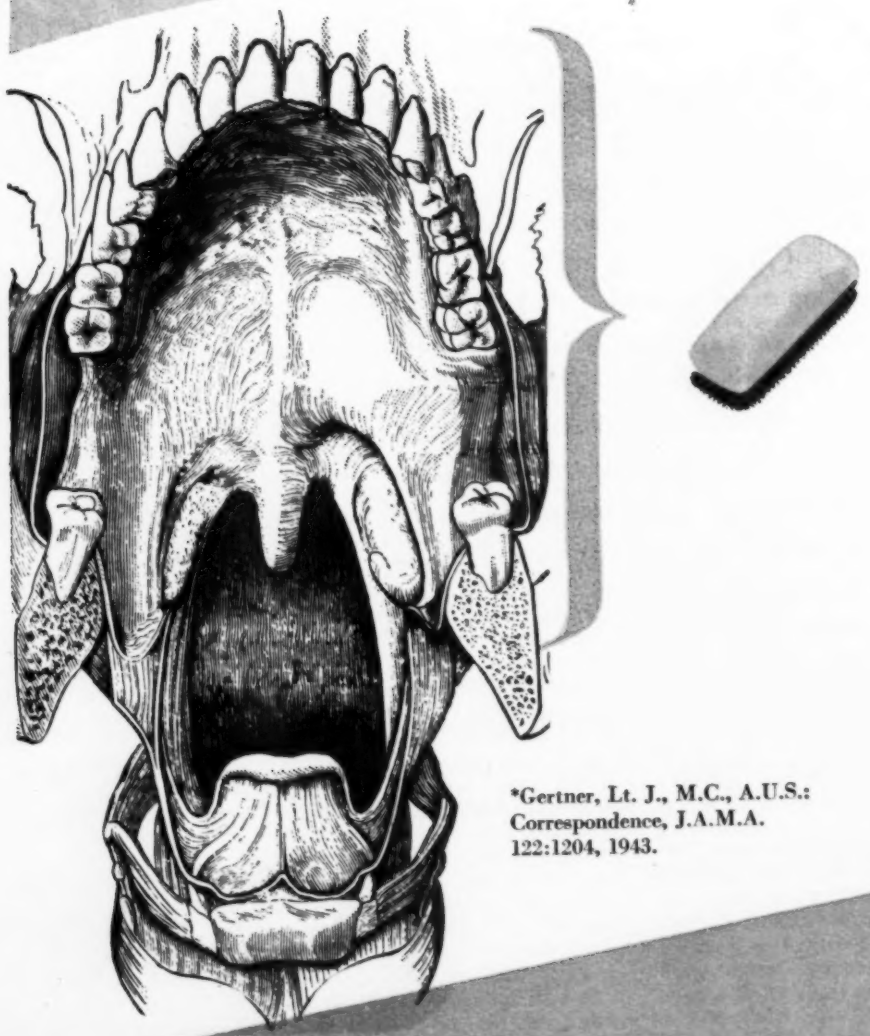

*Gertner, Lt. J., M.C., A.U.S.: Correspondence, J.A.M.A. 122:1204, 1943.

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For use in the peritoneal cavity or wherever complete sterility is necessary. Contains 5 grams (77 grains) sterile sulfanilamide in fine granular form.

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mildewproof, fungousproof and germproof are all composed of powerful antiseptics and germicides which in concentrated solutions are primary skin irritants and in dilute concentrations can sensitize certain individuals and cause dermatitis. Before they are put out for use by the public, they should all be tested in the manner described previously.

"The section of dermatoses investigations of the U. S. Public Health Service is testing materials finished with mildewproof and insecticidal chemicals to be used by our armed forces. We have already found that certain of these will cause dermatitis —even in the high dilutions in which they are used on the fabrics. We have already had reported to us dermatitis among workers applying certain mildewproof finishes to camouflage netting and to sand boxes, and also dermatitis occurring among workers handling these fabrics in the field. Our tests of these particular finishes foretold that they were sensitizers. No cases have been reported to us of dermatitis from wearing the fabrics on which mildewproofing was used which had passed our tests.

"Workers applying finishes to textiles containing chemicals which are skin irritants should be protected from contact with them either by mechanical devices or by machines so built that the worker does not come in contact with the chemical in the process of applying it, or by supplying the worker with impervious protective clothing in the form of impervious sleeves, gloves, aprons or boots. The public should be protected from dermatitis resulting from irritant textile finishes by having the manufacturers test new finishes for their skin irritating properties in the manner described above and using only those which prove themselves to be harmless."

Food

PAUL R. CANNON, M.D., Department of Pathology, University of Chicago, "Food: Facts and Fads," in *New Orleans M. & S. J.*, July, 1944 (97:1, 17-22). Extract: "Food 'enrichment' might better be thought of as a notion than a fad. Perhaps the term 'improvement' would have been a better choice, inasmuch as, for the most part, the attempt has been made to restore to foods certain nutritional properties lost during the process of manufacture. Instead of being enriched, however, some of these foods are still not even back to parity. But regardless of the name, there are foods which, either because of natural poverty or because of processing injury, can be improved artificially by adding to them various food constituents. Food fortification should be more indicated in foods originally deficient in certain dietary elements than in foods impoverished by man. Some of our manufacturing practices are particularly reprehensible in that, by the subjection of naturally good foods to high temperatures and pressures, they depreciate the original nutritional values. For such types of nutritional trauma no amount of so-called enrichment can quite atone, any more than can clean linen substitute for a needed bath. The most recent utilization of the idea of food enrichment is seen in our present-day attempts to correct the deficiencies of cereals, particularly wheat and corn, by adding to them certain types of vitamins and minerals which have been discarded during milling. We can deprecate this milling practice, but the fact remains that: (1) most people really prefer white bread and (2) whole grain flour quickly becomes rancid. If these two problems could be solved the need for flour enrichment would disappear. Our long-time aversion to 'peasant' bread has both a psychologic and physical basis; white bread is thought of as clean and pure, and light bread unquestionably affords considerably greater digestive comfort. And yet we do not prefer white butter, and we go to a lot of trouble now to make our oleomargarine a golden yellow. If we could cultivate a taste for a yellowish bread of the type now used in England as 'war bread,' made from flour of 85% extraction, more of the nutrient values of the wheat berry could be attained. Because there was not time to solve these two important problems in preparation for war and for the feeding of the many people with low purchasing power, the movement to 'enrich' flour was instituted a few years ago as a measure to improve white flour. The difficulty is that the enrichment corrects only vitamin and mineral deficiency, whereas the protein values are as

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Like the active drug itself Sulfathiazole Eye Ointment is effective against a variety of organisms. Thus, satisfactory results have been observed in acute and chronic conjunctivitis, blepharitis, trachoma, infections and ulcerations of the cornea, and prophylactically following corneal injury.

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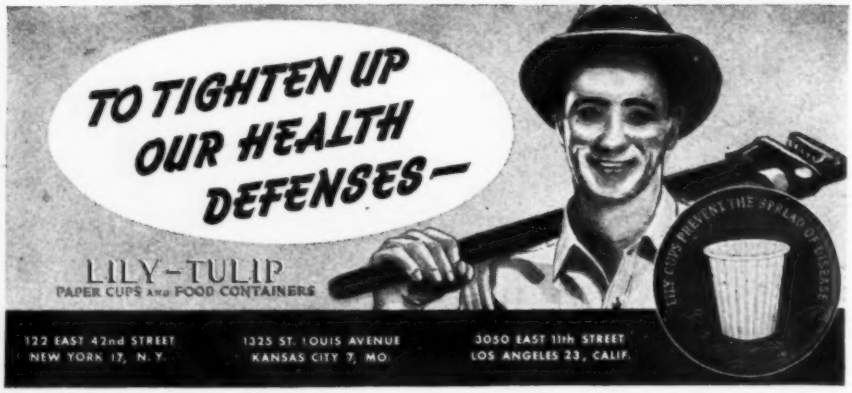
low as they were before. It should be emphasized, however, that an important purpose of bread enrichment was also to use flour as a 'carrier' for vitamins already low in the over-all American diet, and not just to put back into the flour the food constituents lost in milling. The 'white flour problem' is not particularly serious in normal times because bread does not need to be a complete food and is usually supplemented with high quality proteins. But now that flour must serve as a basis for relief rations for starving peoples its protein inadequacy becomes more serious. Fortunately, however, this can be corrected without much difficulty. Several groups of workers have shown that white patent flour can be further enriched by supplementation with several varieties of high quality vegetable proteins, including soybean flour, corn germ, peanut and cotton seed flours. The resulting blend effectively promotes the growth of young white rats as well as recovery of starved animals evidencing the adverse effects of severe protein undernutrition. Such a protein-enrichment program, therefore, should be of great value now because of its low cost aspects and the availability of these vegetable proteins."



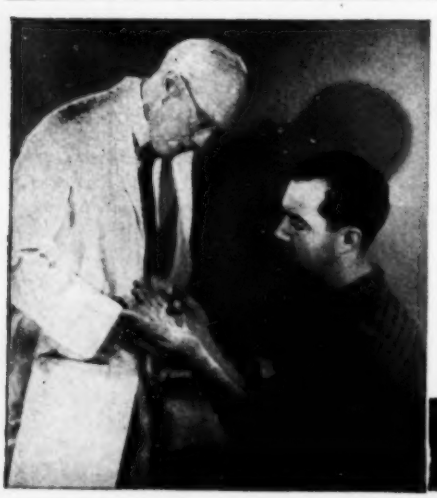
Government Safety

MR. R. R. ZIMMERMAN, Executive Assistant to Chairman, Council of Personnel Administration, "Are Federal Employees Expendable Too?" in *Personnel Administration*, April, 1944 (6:8, 1-5). Extract: ". . . . there is nothing lucky in the over-all picture. Not when the government, with 3,000,000 employees, looks at a figure of almost $10,000,000 in direct accident compensation costs in one year. Not when men, throughout government, are being maimed by the multiplied thousands and killed by the hundreds. Yes, and women, too. For in the same year of 1943 there were 27,000 women workers in government hurt. Tragically, 45 were killed in the one year in the government business. Surely, in the face of these accidents which last year cost the government the productive time of 17,600 full-time workers, no one charged with responsibility for the conduct of the Federal business can afford to be complacent about safety. Nor has the whole story been told yet. The 10 million dollars paid out in claims is a mere fraction of the cost in money and efficiency. When we take into account the interruption of work, the spoilage of material, the damage to equipment, the lost time of supervisors and fellow workers, the lowered morale which generally follows a serious accident, we see that the total cost of accidents far exceeds the specific amount spent for medical bills and compensation claims. The National Safety Council estimates that indirect costs are four times the direct claim costs. In government the ratio is even higher because medical treatment is often provided through government facilities and not infrequently employees prefer to take leave rather than receive the lower compensation rate. The accident loss in money alone is 40 or 50 million dollars a year. While the government accident record is far from good, the average experience in industry as reported to the National Safety Council is not any better. The average frequency rate, that is, 'the number of injuries per million man hours worked,' was 14.85 in 1942 for industry and 12.3 for the government. (12.9 in 1943.) However, only about 50% of the Federal civilian employees are engaged in industrial operations with industrial hazards, as against about 90% in the companies reporting to the National Safety Council. We must realize that these general averages are composed of records good, bad, and indifferent. Let us look at the 1943 rates for a few Federal agencies:

Agency	Frequency Rate
Department of Commerce	10.8
Post Office Department	10.9
Federal Works Agency	11.7
Department of Agriculture	12.2
Veterans Administration	13.1
War Department	15.5
Department of Navy	15.9

"Some of the agencies have shown significant improvement. It is not mere chance that the Corps of Engineers of the U. S. Army, with its vastly increased war building program and with 250% more employees, has in the last two years reduced its frequency rate by 25%. Through an accident prevention program it has brought its rate down to 7.7, substantially below the average for either industry or government. The Department of Agriculture has cut down its frequency rate from 23.2 in 1929 to 12.2 in 1943, a reduction of 47%. Thirty-four people were killed in the conduct of its business in 1938; 15 in 1943. Its severity rate dropped during the same period from 1.9 to 0.65, and the cost of compensation claims fell from $690,000 to $260,000. The Department of the Interior also showed improvement. In five or six years the frequency rate was reduced 20%; the severity 65%; the number

—*Continued on page 754.*



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This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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The editors will exercise care in checking on the accuracy of data printed, but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same, in the current or any subsequent issues, as they may be inclined.

The Journal of Industrial Health, Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 13 | September, 1944 | Number 9

A Comparative Study of Occupational Injuries

—In Men and Women—

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Consolidated Vultee Aircraft Corporation,
San Diego, California

IT IS THE purpose of this paper to give a comparative picture of men and women in industrial work comparing the types of injuries occurring among men and women, and also along age groups. It is based on 50,000 cases.

This is a preliminary report because of the fact that, while during the period covered in this survey we had exact information relative to the number, type, age and sex distribution, we could not, except at tremendous cost, break down our figures further to take into consideration the exact number of men and women in each age group.

Tabulating equipment capable of finding these erstwhile missing factors is now available for our use. This will complete the picture by obtaining this information. When adequate data have been collected the proper corrections giving exact rates and percentages will be made available.

Two years ago the percentage of women being employed at our two plants at San Diego suddenly began to rise. This was viewed with some misgivings.

We began then to anticipate making such changes in our medical organization as would facilitate the care of the multitude of accidents, neuroses, and problems peculiar to women we felt was sure to come. That our anxieties were groundless should be evident from the statistics given below.

First, it should be pointed out that the work many of these women have been doing is work that has always been considered man's work. While it is true that many of the jobs are light, many are difficult and fatiguing. A heavy bomber is not a toy. A B-24 weighs thousands of pounds. No matter how the work is broken down or divided into smaller units, the units are heavy and the corners are sharp.

We had been surprised by the relative simplicity of what was anticipated as a difficult problem. When the records began to show the accident rate for women was not greatly different from that for men a check was made on these records for possible errors.

It was suggested that the explanation lay in that women were taking the easier jobs. A thorough check on this disclosed that in these plants men and women were doing essentially the same work except where excessive lifting or extensive overtime was involved. Weighting the figures with these factors did not appreciably alter the picture.

Intensive checking of other possible conditioning elements likewise failed to alter the facts appreciably.

In our organization, first aid stations are established according to requirements of distance and load in critical positions through the plants. These stations are the first place where all accidents are seen. Cases that are of a serious nature are referred by them to one of the plant hospitals where the case is seen by one of the staff surgeons.

An accident case as described in this article, then, is a case that has been referred by the nurse to the plant hospital. While it is true that many of these cases are minor in nature, the routine first aid type of injury has been eliminated from the statistics. We feel that this is a proper screening.

No differentiation has been made in this article between lost time and non-lost time cases. We feel that many of the present statistics are misleading since often a so-called non-lost time case is more costly to the company that many lost time cases. The figures used in this article, then, are an over-all picture of injuries and are not solely lost time injuries.

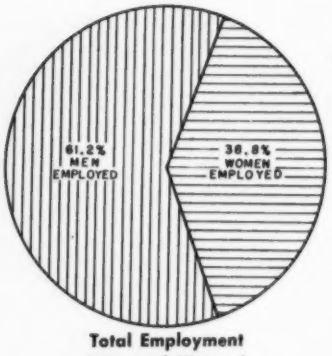
After the slip or blunder occurs which has caused the accident, only luck and possibly proper first aid treatment will determine whether the accident will be serious.

During the period covered, the number of men employed averaged 61% of the total and the women 39%. Of the entire group, 5.08% sustained injuries of an occupational nature of the severity described above. Of the men employed, 5.06% were injured and 4.2% of the women were injured.

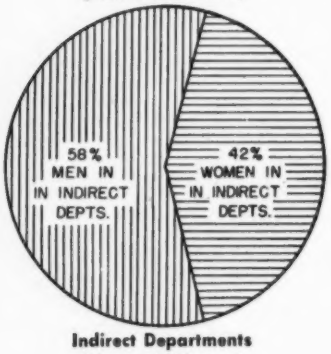
The graphic diagrams will assist in evaluating these percentages, as there was some difference in the classification of the employment. The classification of direct and indirect is somewhat misleading as many of the indirect departments, such as maintenance and transportation, are productive of serious accidents.

Days of lost time for the period covered and arising from accidents during the period covered were of the ratio 64% for men and 36% for women.

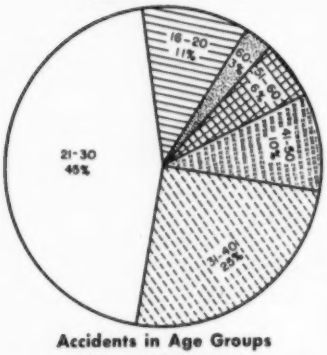
As for the accident ratio in different age groups, differences were found between men and women. The



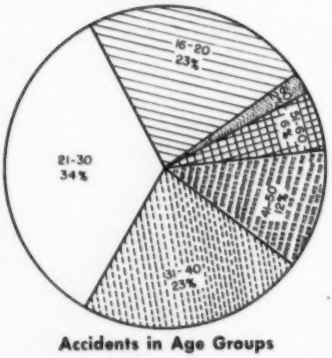
Total Employment (Men and Women)



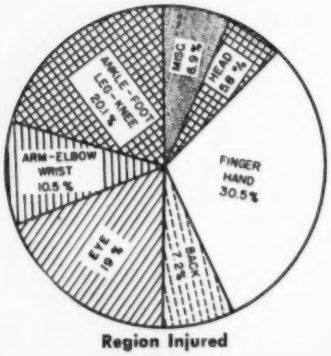
Indirect Departments (Men and Women)



Accidents in Age Groups (Men and Women)



Accidents in Age Groups (Women)



Region Injured (Men)

age group of 21 to 30 showed by far the largest percentage. This was true both of men and women. However, the difference in the case of the men was greater. The age group consisting of those over 60 years of age furnished the smallest percentage in both men and women. We feel that a very comprehensive placement program did much to shield these older workers.

Considering the part of the body involved in injuries, there was considerable difference between men and women. In injuries to the eye, hand, and foot, the men were the most unfortunate. In injuries to the ankle, arm, and back, the women led. For the most part, however, the percentages were fairly equal.

It is interesting to note that, despite a continuous campaign against extreme heels and other dangerous types of shoes, ankle injuries were almost twice as frequent in women as men.

Cases of an occupational nature involving the arm were more frequent among women than men. The more frequent cases were dermatitis and a troublesome tenitis or tenosynovitis. The latter sometimes arose from work consisting of repetitive movements, particularly when reaching was involved, although in many cases the exact cause was in doubt.

Injuries involving the back and abdomen were most frequent among the women. The flabby, overweight woman, especially with postoperative scars, was found to be almost unemployable. The thin, wiry woman gave little trouble even when placed on heavy work.

The frequency of eye conditions is hard to evaluate as cases of kerato-conjunctivitis were grouped in this class; although the occupational connection is certainly open to debate.

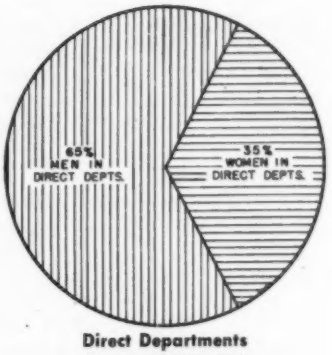
It will be noted that hernia made up only 1.1% of the total cases. Of these, 18% offered definite evidence of a severe strain, although this cannot be taken to mean that the strain caused the hernia. Twenty-eight per cent of the hernia cases presented postoperative abdominal scars, which we feel is significant. Fifty-four per cent of the hernia cases gave no reasonable history of strain or injury. The incidence of hernia was almost double in the men's series.

The cases involving the abdomen made up only 1% of the total cases. However, these were among the most troublesome. Forty per cent of the cases in this category came out of the so-called indirect departments. It is significant that 20% of the cases involving the abdomen had old postoperative scars. We have learned to regard the women who have had extensive pelvic surgery as bad risks.

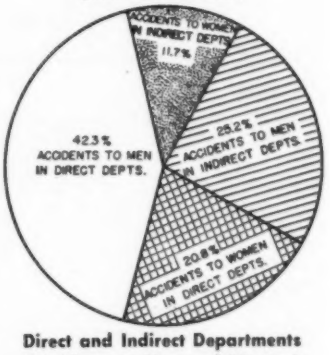
The length of time the employee had worked in the plant had a definite bearing on the fre-

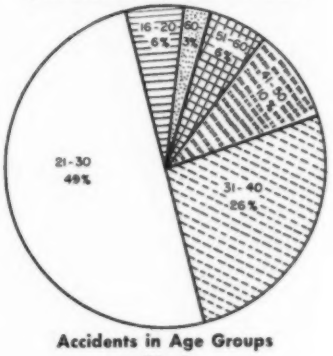
Region Injured	Men	Women	Both
Head	3.9%	5.8%	5.2%
Finger-hand	27.5%	30.5%	29.3%
Back	10.7%	7.2%	8.3%
Eye	13.1%	19.0%	17.0%
Arm-elbow-wrist	14.1%	10.5%	11.8%
Ankle-foot-leg-knee	23.5%	20.1%	21.3%
Miscellaneous	7.2%	6.9%	7.0%

Accidents in Age Groups	Men	Women	Both
16-20	23%	6%	11%
21-30	34%	49%	45%
31-40	23%	26%	25%
41-50	12%	10%	10%
51-60	6%	6%	6%
60-	2%	3%	3%

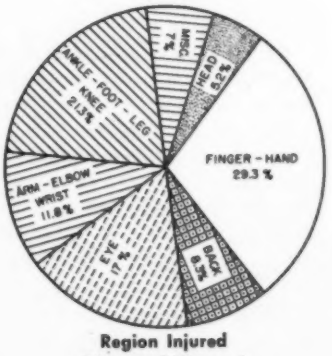


Direct Departments (Men and Women)

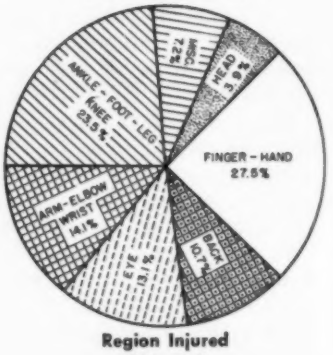

ACCIDENTS TO WOMEN IN INDIRECT DEPTS. 11.7%
25.2% ACCIDENTS TO MEN IN INDIRECT DEPTS.
42.3% ACCIDENTS TO MEN IN DIRECT DEPTS.
20.8% ACCIDENTS TO WOMEN IN DIRECT DEPTS.
Direct and Indirect Departments (Accidents to Men and Women)



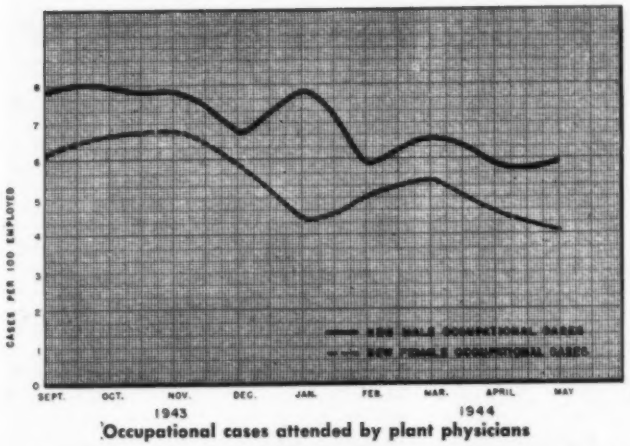
Accidents in Age Groups (Men)



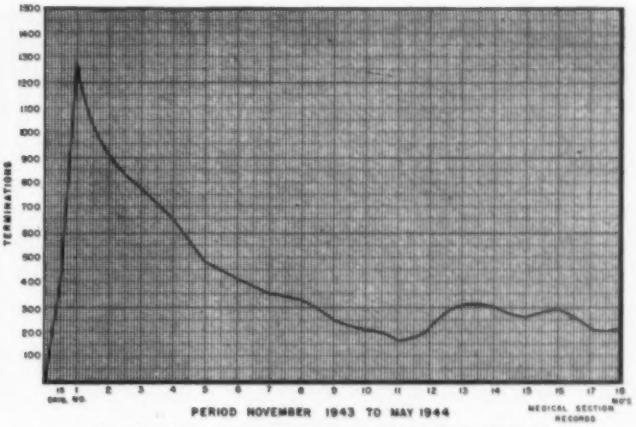
Region Injured (Men and Women)



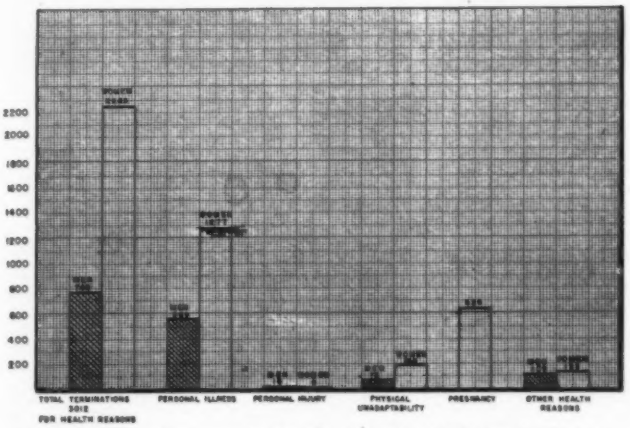
Region Injured (Women)



Occupational cases attended by plant physicians



Terminations for health reasons (3012 terminations)



Terminations of women by length of service (6096 terminations)

quency and severity of accidents. When the percentage of new hires increased, we learned to expect an increase in accidents. This is hardly surprising when it is remembered that many of these people had never been inside of a factory before.

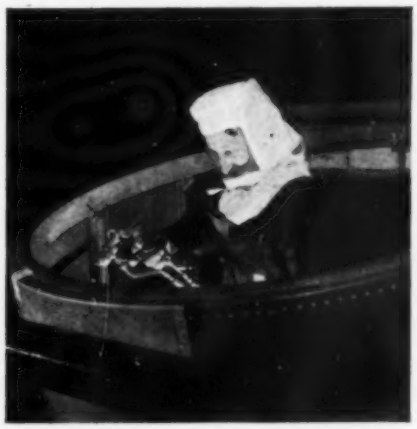
We also found that the reasons for terminations had a definite relation to the time the worker had been employed. Of 6,096 terminations, over 1,200 had terminated during the first month of employment. The termination curve then took a downward trend until the eleventh month when it rose slightly. It is necessary to bring this information into this paper as the shape of the curve is a weighting factor in accident rate. This termination curve was much the same for men as for women except that the peak at the end of the first month was greater for women.

Some additional information on terminations may be interesting. Of a group of 3,012 terminations for health reasons, 769 were men and 2,243 were women. In this group of terminations, the men gave "personal illness" as a reason 569 times and the women 1,277. Thus, more than twice as many women terminated because of "personal illness" than did men. In the terminations due to personal injury, the men's group included 18 terminations and the women only nine. The terminations giving the reason of physical inadaptability showed the men to have 73 terminations from this cause and the women 189. Of the 2,243 terminations by women for health reasons, 636 women gave "pregnancy" as the reason. Subtracting this from the total terminations for health reasons, the women still had a much higher figure than the men.

There are many factors which have an

Women at Work

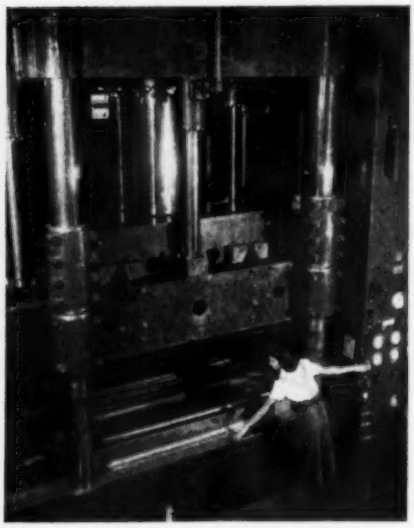
Delivery of communications, blue prints and reports is speeded up in Consolidated Vultee's San Diego plant with scooter equipment. Here, Kathleen Hayden is about to leave on a route with special delivery letters



Employees engaged in painting aircraft parts at Consolidated Vultee's San Diego plant are protected with special masks. Mae Sloan is shown spraying paint while a mask protects her from toxic fumes

Women have taken over most of the transportation work in the San Diego plant of Consolidated Vultee. These car loaders help move the million and a half pounds of material handled daily in the plant

Automatic machines have enabled women to accomplish many types of production work in Consolidated Vultee's San Diego plant. Nelly Gentry is shown operating an automatic riveting machine



Some of the heaviest equipment used in the San Diego plants of Consolidated Vultee is operated by women. Lydia Martinez is shown at the controls of this giant hydro press

When wing center sections near the end of the assembly line they are cleaned. Carmen Martinez is shown here polishing the surface of a Liberator wing

Aircraft manufacturing offers a wide variety of jobs. Helen Moore is shown here making a plaster pattern in Consolidated Vultee's San Diego plant

The difficult job of a crane operator is efficiently handled by Barbara Fledderman who moves assemblies inside one of Convair's large buildings in San Diego

From Jemshog, Sweden, comes Hilda Clifton of the Electric Bench department

There is hardly a job in an aircraft plant which cannot be handled by women. The highly skilled technique of welding chromemoly steel has been acquired by Geneva Hansen, first woman welder to pass rigid tests for this type of work

Painting aircraft assemblies is done mostly by women workers in Convair's San Diego plant. Esther Reinwald, former landscape artist, is shown here using her skill with a paint spray gun

Sidonie Mierlot, native of France, is shown working in the fabric department of Consolidated Vultee's San Diego plant. The machine is used to insert metal clasps in the material

important bearing on accidents. Some can and some cannot be controlled.

A workable and comprehensive job placement program, such as in operation at Consolidated Vultee Aircraft Corporation, is especially necessary when large numbers of women are employed.

The household duties that many of the women have before and after work put a burden on their endurance, and certainly should tend to increase their accident rate.

Many of these women are really working a seven-day week. They come to work fatigued, and their lessened alertness and slower reaction time must increase the number of accidents. In spite of this it is consistently below that for men. However, it might explain their considerably higher "personal illness" terminations.

Inauguration of rest periods during the shift has had a markedly beneficial effect.

The length of time the worker was employed had a bearing on accident frequency rates.

A strict control over toxic products used in the plants has been an important factor in the successful employment of women.

A system of exercises for the relief of dysmenorrhea has been in use in our plants for some time. It has substantially reduced absenteeism from this cause, and may have reduced accident proneness.

Summary

WE HAVE been agreeably surprised at the ability of women to adapt themselves to the hazards and strain of factory work.

2. There is a difference in the type of accidents to which men and women are prone.

3. The flabby, overweight woman is not well suited to factory work.

4. Those women who have had extensive pelvic surgery are often poor risks.

5. We believe the usual statistics on accident rates may be in error, because most of the emphasis is placed on lost time cases. Multitudes of no-lost time cases have not been considered.

Our ratio of lost time to non-lost time injuries is approximately 1 to 350.

6. A comprehensive job placement program is a necessity where large numbers of women are employed.

Conclusion

WHILE the following conclusion may not derive entirely from the above study, it presents itself as an interesting thought.

There has been some discussion as to the position of women in industry after the war. In many instances it has been considered that women would be uneconomical to employ because of problems peculiar to their sex.

We feel that the success of women working in industry is dependent on the proper placing of them on jobs suitable to their physical and mental capabilities, and apparently they are capable of working side by side with men without harm to themselves. We feel that, otherwise, there will be many breakdowns and that ill considered legislation, controlling the working of women, will be enacted. This legislation can easily create a situation wherein it would be unprofitable for an employer to use women in factory work. We feel that women's permanent position in industry is dependent on the proper application of these considerations.

This matter should have full and frank discussion.

Welding Fumes in Steel Fabrication

PHILIP DRINKER,
Chief Health Consultant, U. S. Maritime Commission, Washington, D. C., and
Professor of Industrial Hygiene, Harvard School of Public Health, Boston, and
KENNETH W. NELSON, LIEUT., H-V(S), USNR,*
Regional Health Consultant, U. S. Maritime Commission, Chicago

ALL MODERN welding processes are designed for the rapid production of intense heat within a small area. The process in greatest use today for steel fabrication and in production welding is the electric arc employing coated welding electrodes. Gradually the coated electrodes have displaced the uncoated, as it is possible with the coated rods consistently to make better and stronger welds at much higher speeds.

Like many industrial processes, welding has evolved a terminology of its own. Both direct current and alternating current are employed at the arc. When direct current is used polarity must be considered. When the base metal is made the positive terminal and the welding electrode the negative, the hook-up is called "straight" polarity. Conversely, when the base metal becomes the negative terminal and the welding electrode the positive it is called "reverse" polarity. These words may be confusing to the uninformed but are accepted usage in the welding fraternity.

Alternating current is employed at the arc in both large and small welding sets, such as for production and repair work, especially in small shops. These sets usually use standard commercial 60 cycle circuits. Rods are now available for use with either A.C. or D.C. sets.

So far as health problems go, it makes no difference whether the set is A.C. or D.C., or whether reverse or straight polarity is used.

SHIELDED ARCS AND COATED ELECTRODES. The so-called shielded arc is produced by special coatings baked on the welding electrode. Some of this coating burns to form a protecting gas shield around the molten metal as the metal passes across the arc, while the mineral portion of the coating forms a protective slag on top of the molten metal. Thus there is less oxidation of metal, less formation of nitrides, the metal cools at the proper rate, and the work is done faster than is the case with bare electrodes. From the practical standpoint, virtually all production welding today is done with coated electrodes.

WELDING ELECTRODES. In the Welding Handbook[1] of the American Welding Society, one will find an excellent chapter on electrode coatings, weld metal, and slags. From this book we have drawn freely. Knowing our interest in the hygienic aspects of welding, the Welding Committee of the National Electrical Manufacturers Association obtained from its members the composition of their welding electrodes and coatings. The production of the firms contributing represents over 90% of the welding electrodes made in the United States.

Welding electrodes are designated by various trade names corresponding to numbers assigned by the American Welding Society. Some of these numbers and their use in steel fabrication are as follows:

Presented at the joint meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS and the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, St. Louis, Missouri, May 11, 1944; published concurrently in *Texas State J. Med.*, September, 1944.

*The opinions and assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Number E 6010 is an all-position direct current reverse polarity electrode. It is used on common steel and galvanized iron. In the first quarter of 1944 it comprised about 48% of the welding electrodes used in the United States. Number E 6011 is used on A.C. welding and in all positions (vertically, overhead or horizontally) but accounts for only 2% of the total. Numbers E 6012 and E 6013 are known as cold electrodes and are used on straight polarity or on A.C. and account for 30% of the total used. Numbers E 6020 are commonly called "hot rods" by the welders because they are used at high current densities resulting in high burn-off rates and deep penetration. They are adapted especially for downhand or filet work, A.C. or D.C. They comprise about 10% of the total output.

Stainless steel electrodes were developed for welding corrosion-proof tanks and stainless steel of various kinds. They are used also on certain kinds of armor plate. They account for about 5% of the total, while various special non-ferrous and ferrous alloy electrodes account for the balance.

The composition of the wire used in all of the E 6000 or mild steel and the stainless steel electrodes is given in the following table:

TABLE I.
ANALYSES OF WIRE IN MILD STEEL AND STAINLESS STEEL WELDING ELECTRODES

Wire Analysis	Mild Steel (E 6000)	Stainless Steel
C	0.7 -0.25%	0.07- 0.25%
Mn	0.40-0.60%	0.40- 2.5%
Si	0 -0.30%	0.20- 0.60%
S	0 -0.035%	0 - 0.035%
P	0 -0.035%	0 - 0.035%
Cr		18 -26%
Ni		8 -21%
Fe	Balance	Balance

The coatings used for these same types of electrodes are likewise controlled within limits but it is permissible to vary the ingredients somewhat. In Table II we give a summary of the analyses assembled for us by the welding electrode manufacturers.

TABLE II.
ANALYSES OF COATINGS IN MILD STEEL AND STAINLESS STEEL WELDING ELECTRODES

Electrode Coatings	American Welding Society Types E 6010	E 6011	E 6012 E 6013*	E 6020 E 6030	Stainless
H_2O	Under 10%	Under 10%	Under 10%	Under 10%	Under 10%
Sodium silicate	30—40%	25—35%	10—20%	10—20%	15—20%
Cellulose	20—30%	20—30%	3—10%	Under 5%	
$MgSiO_3$	10—25%	15—30%	10—20%	5—20%	Under 10%
TiO_2	10—20%	10—35%	30—50%	Under 6%	Under 10%
Ferro Mn	10—20%	5—10%	Under 10%	5—20%	Under 10%
MgO		5—10%	Under 5%	Under 5%	
ZrO_2		Under 5%	Under 5%		
Al_2O_3 (clay)		5— 7%	5—11%	Under 10%	
SiO_2			15—20%	10—30%	Under 15%
Feldspar			10—20%		Under 10%
Mica				10—20%	
$CaCO_3$				Under 10%	20—30%
Iron Oxide				15—30%	
MnO_2				10—25%	
CaF_2					20—30%
Mn					Under 10%
Mo					Under 5%
Cr					Under 5%

*Note: E 6013 same as E 6012 except cellulose may be up to 25%.

There are several items in Table II which need explanation. The moisture content is not constant, as the temperature at which the coatings are baked can be varied over a considerable range. Sodium silicate is the binder which is common to all coatings. Magnesium silicate, clay, asbestos, mica, and feldspar are used variously. Thus, a manufacturer can use the mineral feldspar or he can use a combination of several silicates to give substantially the same result. Titanium dioxide, usually as the mineral rutile, is a common agent for arc stabilization and may contain some zirconium dioxide as an impurity. Manganese, as ferro-manganese, is added as a deoxidizer. Silica is not used as such but is present both as a mineral silicate and in sodium silicate. Calcium carbonate as limestone is used for slagging and is especially important in the stainless steel electrodes. These latter all contain calcium fluoride, usually as the mineral fluospar.

In mild steel welding with all of the E 6000 electrodes, the fumes evolved contain[2] about 60 to 70% of $Fe_2O_3 + TiO_2$, from 10 to 30% SiO_2, and from 2 to 12% MnO[2].

When welding on galvanized iron, the total fumes increase with the introduction of some 65% ZnO and a corresponding drop in $Fe_2O_3 + TiO_2$, MnO_2, and SiO_2. In welding with stainless steel electrodes, the total weight of fume is about the same as for mild steel welding but the analysis is quite different. The following is typical of fumes from stainless steel:

SiO_2	5.8
F	17.6
Fe_2O_3	16.1
Cr_2O_3	8.3
NiO	2.3
CaO	9.7
MnO_2	2.8

GASES EVOLVED IN WELDING. Both the electric arc and the acetylene torch fix some nitrogen from the air as oxides, the exact amount varying with operating conditions. One of these oxides, NO_2, is a lung irritant. It was pointed out previously that one of the functions of the coatings of modern welding electrodes was to prevent reaction of the weld metal with the oxygen and nitrogen of the air. It has been shown[2] that less NO_2 is formed with the coated than with the uncoated electrodes.

Carbon dioxide and water vapor are evolved in welding with coated electrodes but carbon monoxide in hygienically significant amounts has not been reported, so far as we know. In explaining the shielding action of the products of combustion of the coatings, welding experts suggest that CO is formed and then converted to CO_2 on leaving the immediate vicinity of the arc.

Theoretically HF could be evolved from the coatings of the stainless steel electrodes. In our gas cabinet we burned a great many such electrodes recently in response to complaints about the irritating nature of the fumes and found no HF. However fluoride compounds are, of course, present.

THE EFFECTS OF BREATHING WELDING FUMES. Every welder knows what happens if he breathes excessive doses of zinc oxide, ZnO, from welding on galvanized iron. We have had some reports of metal fume fever come from physicians who were unaware of the significance of the chronology of events which accompany a typical attack of metal fume fever. Therefore we reproduce a simple chart which illustrates this chronology.[3] (See Fig. 1.)

Following inhalation of zinc oxide the body temperature gradually increases, reaches a peak in about six to eight hours and is back to normal in about 24 hours. White counts increase a little quicker and remain high a little longer than body temperatures. No therapy so far reported is of the slightest avail—we have tried hot baths and steam baths, milk antipyretics, and various beverages (alcoholic and non-alcoholic). A certain resistance persists for the duration of the leukocytosis and this, perhaps, accounts for the common industrial observation that attacks of the fever are unlikely on two successive days.

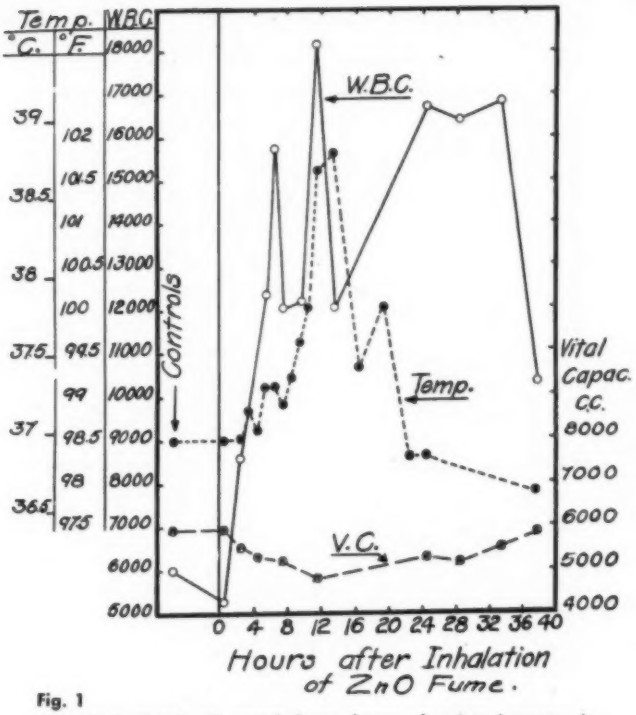


Fig. 1

A typical attack of metal fume fever, showing increase in leukocyte count, body temperature, and drop in vital capacity. Note that fever abates before the white count returns to normal. (After Sturgis, et al., courtesy J. Indust. Hyg. & Toxicol., 9: 88, 1927.)

Sometimes the metal fume fever attacks induce severe coughing which may cause vomiting, but this is not common. It has been reported, however, fairly often, as it is apt to worry the men more than anything else they experience in the course of such an attack.

Fatal pneumonias have been reported following a few instances in which men welded in relatively confined spaces without ventilation. But such occurrences are uncommon. The cause has been ascribed to the NO_2 gas, a powerful lung irritant. The evidence blaming the NO_2 is not altogether convincing but in the few cases reported there is no other reasonable explanation.

A recent study of some 864 cases of pneumonia in the Richmond, California yards of the Kaiser Corporation made by Collen, Dybdahl, and O'Brien[4] showed that pneumonia was no more common among welders than among other crafts in the yards. They found, further, that the fatality rate was about the same for all shipyard crafts. Their data are shown in Table III.

TABLE III.
RELATIONSHIP BETWEEN INCIDENCE OF PNEUMONIA AND OCCUPATION

Occupation	Number Cases	Number Deaths	Number Employed	Morbidity Rate Per 1000
Welders	159	14	15533	10.2
Shipfitters	74	11	7998	9.3
Flangers	60	6	4842	12.3
Laborers	53	5	4923	10.8
Burners	42	2	4389	9.6
Electricans	41	2	3575	11.5
Pipefitters	38	5	3117	12.2
Machinists	36	4	3153	11.4
Shipwrights	29	1	2768	10.5
Chippers	24	1	3076	7.8

In relatively few cases occurring among new employees we have had complaints of chronic coughs which wake the patient at night. Occasionally such illness has been accompanied by hemoptysis. On examination the chest has been reported as normal, there is no fever, and no indications whatever of tuberculosis. On assigning such a man to a workplace in which exposure to welding fumes is negligible, recovery is usually rapid and complete.

VENTILATION IN WELDING. In open shops it often is not necessary to use local exhausts. The general ventilation of the building may suffice. If production work is to be handled, such as pipe welding, it usually speeds up production to apply local exhausts with flexible hose. We have many such installations in our shipyards all over the country. Neither management nor labor would dispense with them.

In ship construction, both general ventilation and local exhausts are used. We admit that the intelligence and effectiveness with which ventilation is applied varies greatly. We have some yards where it is excellent and others where definitely it is not. As a guide, we recommend local exhausts drawing about 200 cubic feet per minute per welder with the exhaust hood placed within 8 inches of the work.

Where general ventilation is the method used, we recommend at least 400 cubic feet per minute per welder.

In galvanized iron welding, we suggest that concentrations of zinc oxide in the air breathed be kept below 15 mgs. per cubic meter. We have yet to hear of metal fume fever being caused at concentrations below 15 mgs.[5]

In welding mild steel, we suggested concentrations of Fe_2O_3 below 30 mgs. per cubic meter.[6] Since Fe_2O_3 of itself causes no discomfort or measurable reaction, the 30 mgs. is simply an empirical figure suggested as the easiest yardstick for estimating adequacy of ventilation. In shipyard work, we have had no complaints when air pollution was below 30 mgs. We have had plenty of complaints when it exceeded this figure by an appreciable amount.

We have no figures for permissible pollution from welding with stainless steel. From experimental work, we know the fume is no harder to catch than that from welding with mild steel so that we recommend the same local exhaust ventilation—at least 200 cubic feet per welder per minute.[6] From limited trials we believe that the 30 mgs. of Fe_2O_3 per cubic meter will serve as well for the stainless steel as for fumes from mild steel.

The conclusions which we believe can be drawn from welding work all over the country are that when good ventilation is enforced there will be no trouble. When ventilation is ignored, especially on galvanized iron and stainless steel, justifiable complaints will be made.

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See also: Minimum requirements for safety and industrial health in contract shipyards. U. S. Navy and U. S. Maritime Commission. 1943.

The Maritime Commission and Navy have prepared a sound strip film, "Welders—To Your Health!" We have found the film very helpful in teaching both workers and management the advantages of good working conditions for welders. We will furnish copies of this film and record at cost to any firm desiring it. It can be seen at most of the shipyards in the country.

Injuries to Hearing

—In Industry—

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President, American Society for the Hard of Hearing

NOISE in industry is a public health problem. Continuously loud noise not only damages the hearing of workers but also affects their health and efficiency. Industrial compensation commissions may shortly be, if they are not already, confronted with large numbers of claims for injury to hearing, which neither they nor the claimants are prepared to handle with good judgment. In order to explain the difficulties in solving the problem, observations of hearing defects in one industry are here submitted.

A sampling of the effects of industrial noise in shipyards was obtained by testing the hearing of 296 workers. The testing equipment, a well-known make of audiometer, was set up in a room of the first-aid building. At this center many workers appeared daily for treatment and observation of various complaints common in any heavy industry. This was the only convenient time to obtain workers and to test their hearing, since they were already excused from work and were in the building in which the testing room was located. The tester simply asked if he could test their hearing. No effort was made to persuade them, and no discussion was given regarding the effects of noise on their hearing, although some of them volunteered the information that their ears ached or had ringing sounds.

Fig. 1 is the average hearing of 315 high school students which is introduced here to be compared with the hearing of the shipyard workers. This chart or audiogram is derived from tests by a pure tone audiometer, which resembles a radio in construction. One dial regulates loudness in discrete, graduated steps, expressed in terms of decibels. The other dial permits introduction of pure tones at octaves and half-octaves arranged along the scale for hearing speech. It is thus possible to measure how well (or poorly) a person hears each of the pure tones and to register the result on the audiogram as in Fig. 1. The farther the curve is below the zero or normal (average) hearing line, the greater is the amount of loss in hearing. Since the test of the high school students was given in a quiet room (not a soundproof room), the 10-decibel line stands for the best hearing obtainable under the conditions. It is noticeable that there is a slight reduction in hearing at the octaves 4096 and 8192. This indicates that a substantial portion of high school students (over 10%) have deafness in the high tones. This chart may be used as a guide to observe the degree of deviation in hearing among

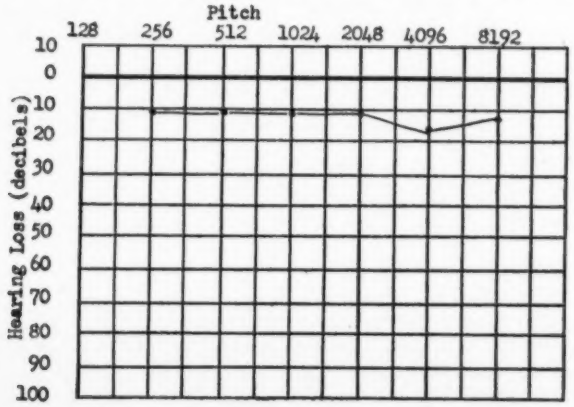

Fig. 1.
Average hearing loss of 315 high school students—630 ears

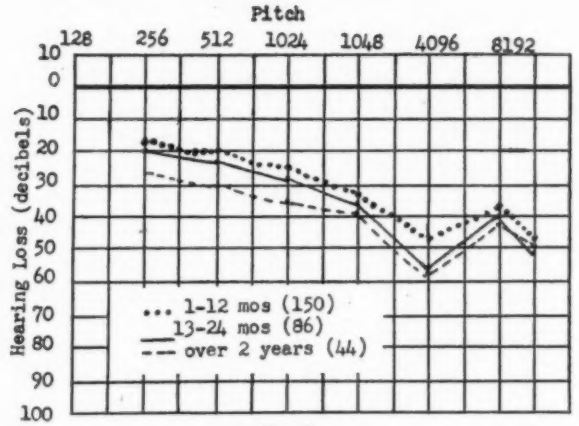

Fig. 2.
Hearing loss of 280 shipyard workers by length of time worked

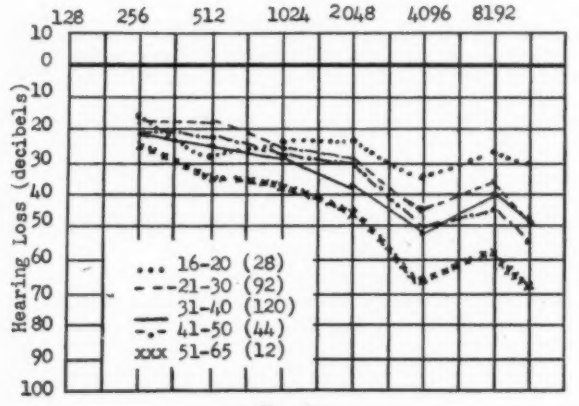

Fig. 3.
Average hearing loss of 296 shipyard workers according to age

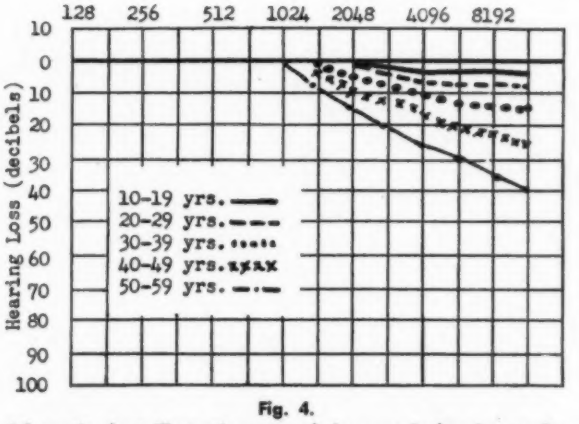

Fig. 4.
Schematic chart illustrating normal decrease in hearing acuity with increasing age

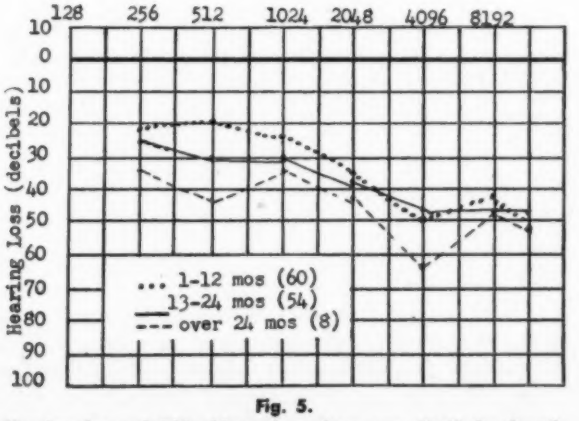

Fig. 5.
Hearing loss of 122 shipyard workers age 31-40 by length of time worked

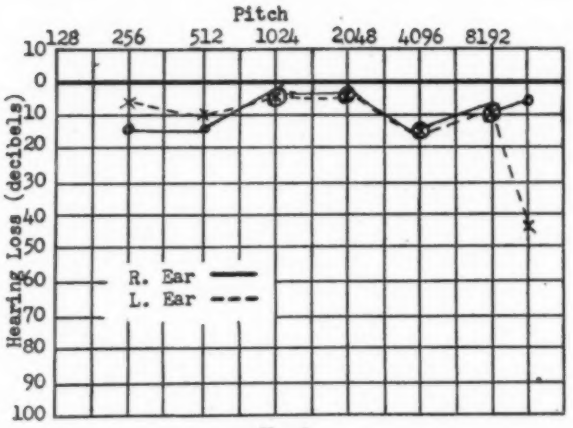

Fig. 6.
Hearing loss of shipyard superintendent 2½ years service—age 38

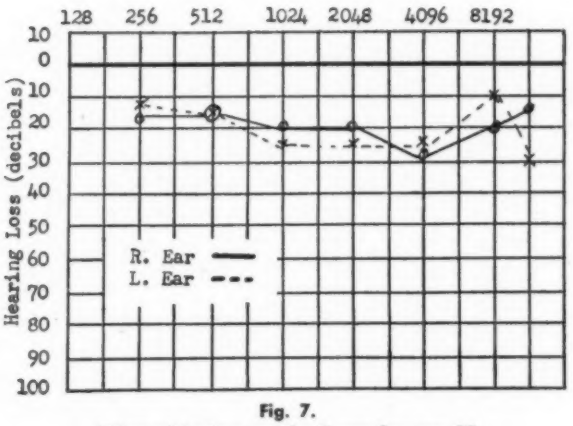

Fig. 7.
Shipyard janitor—service 5 months—age 35

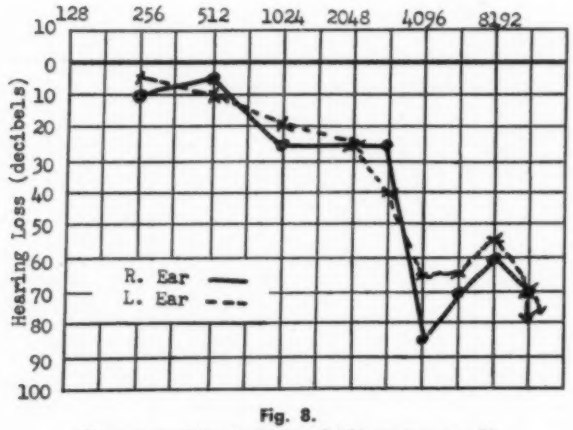

Fig. 8.
Chipper working in shipyard 1½ years—age 25

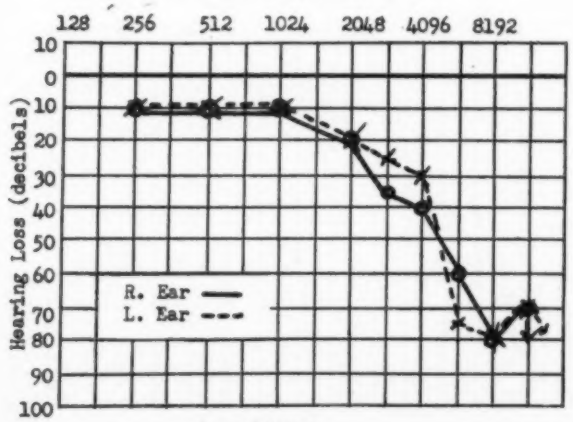

Fig. 9.
Shipfitter working in shipyard 1 year—age 27

workers in industry, or, in this instance, a shipyard.

Fig. 2 indicates the average hearing of 560 right and left ears of men who have worked one, two, or more years in the shipyards as welders, shipfitters, chippers, etc. Four important features are observable: (1) There is a marked loss in hearing compared with the average hearing of young persons as in Fig. 1. (2) The loss is markedly greater among those who have worked longest in the yards. (3) The nature of the loss is a sharper drop in the higher tones than in the low tones. (4) The longer the men worked, the greater is the involvement in the lower tones, which condition eventually produces severe deafness. However, the curve in the lower tones may have been influenced by the testing conditions, which were not wholly satisfactory but the best obtainable. Doubtless the lower tones would have been closer to the zero line if the tests had been given in a soundproof room.

In order to ascertain the extent to which age may have influenced these curves, the hearing of the men was tabulated according to ages (Fig. 3). The difference between the curves is marked, which is to be expected since hearing with age becomes less acute in the high tones. However, all of the age-curves for the shipyard workers show much more severe loss than the normal-age curves depicted in Fig. 4. Likewise, comparison of the high-school age curve in Fig. 1 with the curve of similar age in Fig. 3 indicates the great damage already done to the hearing of the youngest workers.

In Fig. 5, the factor of age was eliminated by tabulating the workers in one age-group only, 31-40 years, according to the length of time they had worked. It is seen again that the longer the men worked, the greater became the injury to their hearing. It is interesting to compare the curves of some of the workers who did not work continuously in excessively noisy environment. Fig. 6 is the audiogram of a shipyard superintendent who had worked two and a half years in the yards. His curve is fairly close to the 10-decibel line with the exception of one high tone. Obviously he did not obtain injury to his hearing in spite of his lengthly period in the yards. Likewise, the janitor in Fig. 7 had worked five months in the yard with much better hearing than that of the youngest shipyard group.

At this point one should consider the significance of the facts reported above. Obviously noise has been the responsible agent for sharp reduction of hearing acuity. Similar types of deafness can be produced in the laboratory. Ewing and Ewing[1] administered a single tone at 110-decibel loudness continuously for two minutes. The subjects were found to have a loss of approximately 30-decibels. This loss disappeared

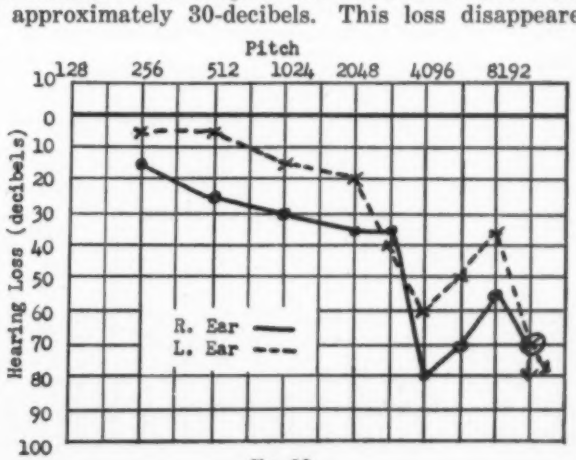

Fig. 10.
Welder working in shipyard two years—age 21

within a few days. It may be assumed that, since the workers came directly from a noisy environment in the shipyards to the testing room, some of the deficiency in hearing may have been temporary. However, if an exposure of a loud single tone for two minutes cuts down hearing efficiency under laboratory conditions, the continuous blasting of riveting, chipping and similar noisy equipment for eight hours a day over one or two years should produce greater and probably permanent hearing defect. Experimenters[2] have proved that when one ear is closed, the ear exposed to noise shows degeneration in the cochlea, while the non-stimulated ear is not damaged. Microscopic study[2] of ears of animals exposed to loud tones shows degeneration of the nerve cells in specific areas of the cochlea.

Another important implication is the possibility of claims for industrial injury. The four audiograms (Figs. 8, 9, 10 and 11) are typical of the hearing curves found in the study. Suppose these men claim that their hearing was damaged while working in the shipyards. The boilermaker's loss (Fig. 11) is very severe. However, he can't prove that all of this loss occurred in the shipyards because he had worked over 20 years in his profession prior to his employment. On the other hand, the compensation authorities can't prove that he didn't acquire the loss in the present job because the hearing was not tested at the beginning of employment. Although the other three men have severe hearing defects, it would be difficult to prove that they acquired the loss or didn't on the present job. The commission doesn't have audiograms to prove its case. It can, however, use the argument that these men could have had the hearing loss previous to their employment. That this probability exists is demonstrated by the audiograms, Figs. 12, 13, 14, 15 and 16.

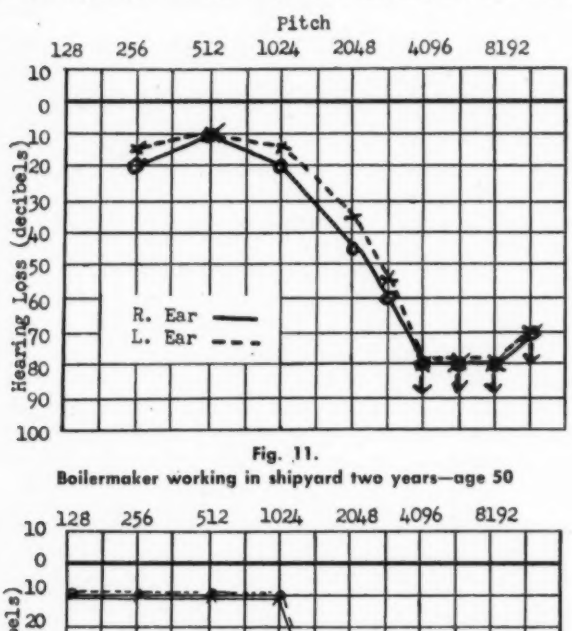

Fig. 11.
Boilermaker working in shipyard two years—age 50

Fig. 12.
Hearing loss of an eight year old child

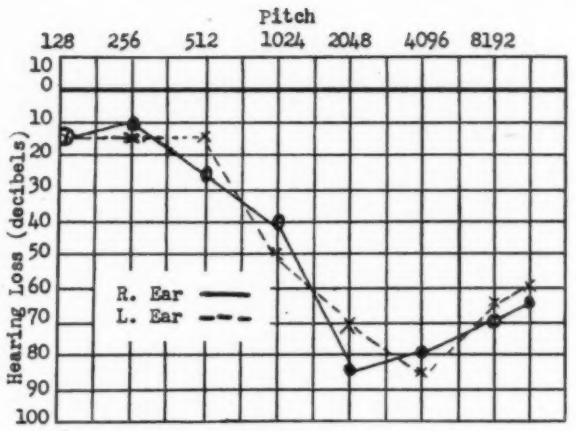

Fig. 13.
Hearing loss of a 17 year old student

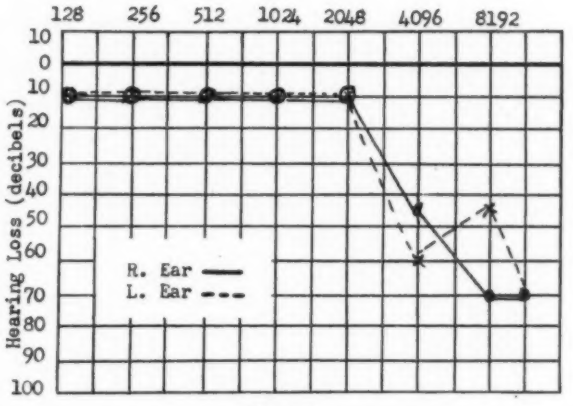

Fig. 14.
Hearing loss of a 19 year old student

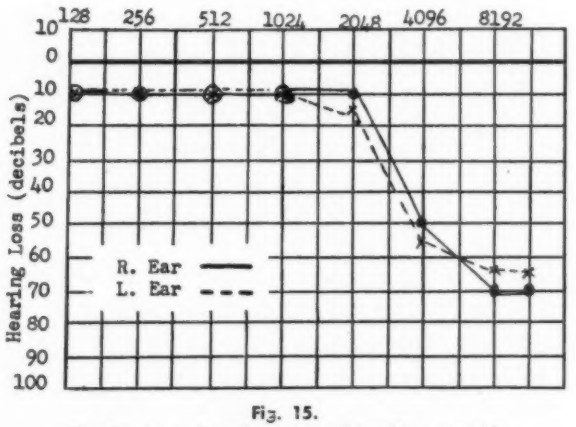

Fig. 15.
Hearing loss of a school custodian—32 years old

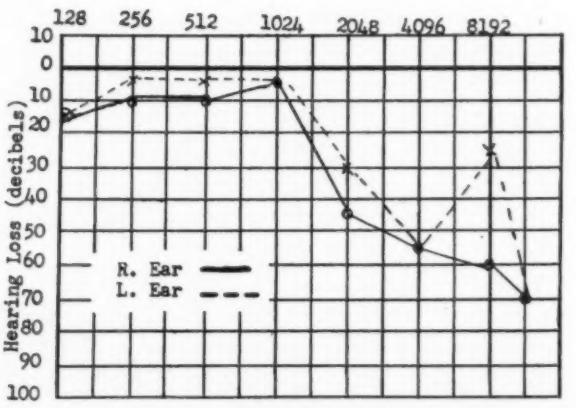

Fig. 16.
Hearing loss of high school principal—50 years old

which show that hearing losses may occur at most any time in a man's life. The hearing curve of the young child (Fig. 12) resembles those belonging to the men who might file a claim for damage in industry! Or, to reverse the situation, suppose the high school students, the school custodian and the high school principal worked in the shipyards or any industry, and later filed claims for injury to their hearing. What is to prevent them from proving their claims? These situations are probably duplicated many times today. Finally, the age of the employee might be studied in connection with the degree of his impairment in order to judge the extent of the damage to the hearing due solely to industrial noise.

The impasse regarding compensation due to hearing injuries may be broken if industrial leaders and employees will insist on certain practical procedures. The hearing of employees who are to work in noisy places should be tested prior to the time of their assignment. Dr. George E. Shambaugh[3] recommends additional measures to prevent damage to hearing. He proposes that improvements be made in designing machinery to lessen reverberation and to use sound-absorbing materials in walls and ceilings of factory rooms. Employers should insist that employees who work around noise wear protectors for their ears. Numerous types have been devised in recent years. These range from treated cotton and wax plugs to plastic and rubber molds that fit the ear canals. Although these devices are effective in protecting the ears from excessive noise, they reduce the hearing of speech to a more or less degree. Hence certain persons such as aviators cannot wear them because they need good hearing in communications work. However, it is just as logical for employers to protect themselves from claims for noise trauma by insisting on the use of ear stoppers, as it is for them to regulate the use of goggles to prevent damage to the eyes.

If the industrial leaders, and incidentally the army and navy, had obtained hearing curves of their workers before employment, the task of determining justification for accident compensation would have been easier. Meanwhile, the alarming increase in damaged hearing of employees should result in insistence by both workers and employers that hearing be protected by known practical measures.

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Physical Medicine in Industry

—Organization; Administration; Function; Results—

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Rahway, New Jersey

THE increasingly important role which physical medicine is destined to play in postwar medical practice is manifested in the steadily growing interest in this specialty. In great part this resurgence of interest may be ascribed to the manifold benefits being derived from the employment of physical therapeutic measures in the rehabilitation of the wounded soldier. Indeed, as Dr. Ray Lyman Wilbur, Chairman of the Council on Medical Education and Hospitals of the A.M.A. has stated: ". . . just as the last war is said to have put orthopedic surgery on its feet, this war may well do the same for physical medicine."

From the practitioner's standpoint probably no branch of medical practice stands to benefit more from the full utilization of this type of therapy than does industrial medicine and surgery. The prolonged period of disability, sometimes total but more often partial, which continues sometimes for weeks and months, after all external evidence of injury has disappeared, is one of the most difficult problems which the industrial physician has to face. It is in shortening this period of disability, or relative disability, that physical therapeutic measures (electro-, hydro-, mechano-, and light therapy[1]) are most effective, thereby providing at least a partial solution to the difficulties of the physician and saving industry uncountable man-hours which would otherwise be lost.

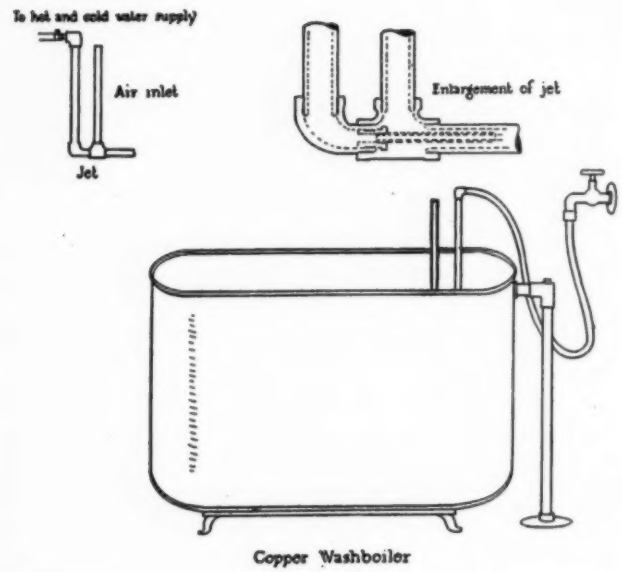
Every industrial medical division should have a physical therapy department, staffed and equipped to care for the following types of case through the use of proper physical therapeutic measures if best results are to be expected. (See Outline below.)

The organization, administration and function of a physical therapy department within a plant medical department are outlined below.

Organization

PHYSICAL THERAPY departments of industrial medical divisions should be located in combination with or adjacent to the dispen-

TYPE OF CASE	PHYSICAL THERAPY	RESULTS TO EXPECT
Fractures	Heat; correct scientific massage; muscle-setting exercises; early mobilization.	Better functional results; shortened convalescence.
Contusions	Cold applications first 12 to 24 hours; luminous heat after organization; friction massage and exercise.	Reduced subcutaneous hemorrhage; less restricting fibrosis; better functional restitution.
Infections: 1. Furuncles	Hot compress (hypertonic solution.)	More rapid localization and drainage; subsequent reduction of cicatrix.
	Short wave diathermy	Less chance of spreading the infection to surrounding area in addition to the above.
2. Abrasions Lacerations Puncture wounds	Hot continuous compresses using a hypertonic solution.	More rapid localization of infection and an improved vitality of surrounding tissue.
Strains and Sprains	Cold applications for first 12 to 24 hours if extravasation of blood and lymph are evident. Early application of best sedative massage and a subsequent corrective exercise program.	Reduced loss of time; reduced hospitalization; earlier functional return; reduced residual disability.
Soft tissue inflammations	Non-luminous infra-red correct type of massage (if not contra-indicated) active exercises.	Rapid recovery of function.
Dermatitis	Early thermal compresses or soaks using mild oxidizing or reducing agents or a neutralizing solution.	Removal of causative factor; reduction of irritation to patient; cleansing of the area and shortening the duration of the inflammation.
Burns: Thermal or Chemical	Early and prolonged application of cold, mild oxidizing or reducing agents.	Reduced lymph flow; relief of pain; reduced metabolic activity; reduced tissue damage; early repair.



INDICATIONS:

1. Relief of edema.
2. Painful cicatrices.
3. Trophic lesions resulting from prolonged suppuration.
4. As preparation for local massage.

SPECIFICATIONS:

Copper washboiler
½", 90° elbow
½", 90° street elbow
½" tee
½" to ⅛" bushing
⅛" pipe
Outlet—¾" nipple with locknuts and gasket
½" galvanized iron pipe, enameled white
Street elbow is tapped inside at male end to fit ⅛" bushing
⅛" pipe used for nozzle

A local tinsmith can assemble this unit. A factory product will look better and will be more convenient, but the therapeutic efficacy of it remains the same.

Fig. 1. Home made whirlpool bath (The A.M.A. Council on Physical Therapy will furnish plans for other equipment.)

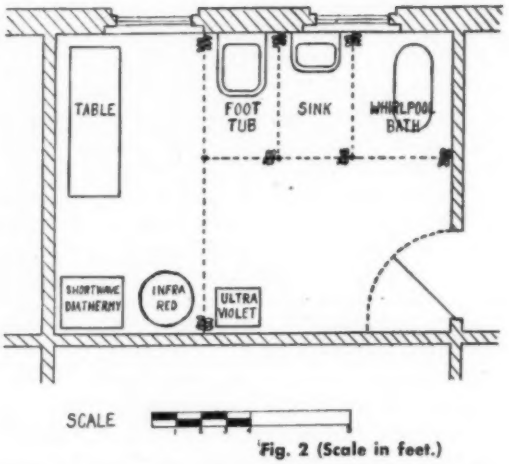


Fig. 2 (Scale in feet.)

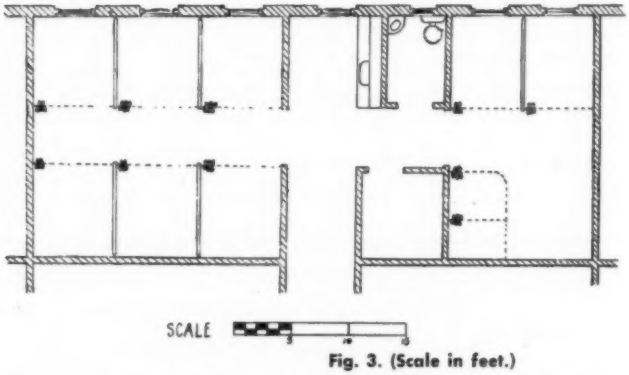


Fig. 3. (Scale in feet.)

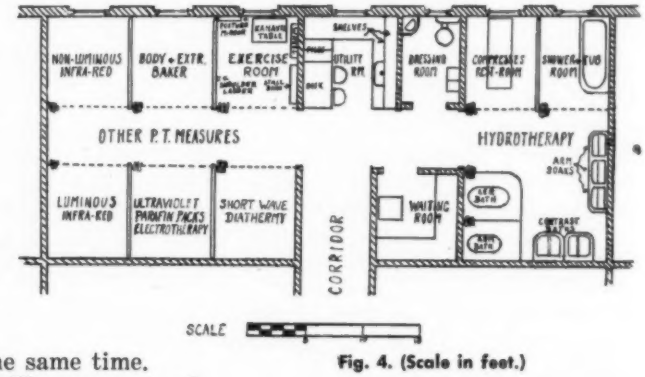


Fig. 4. (Scale in feet.)

saries. These arrangements are just as important as having clinical laboratories or roentgenological departments so situated. Each department should be easily accessible and provisions made for expansion. A physical therapy department should be organized on a moderate scale and so designed as to fit the needs of the particular industry which it serves. The organization of departments of different sizes is outlined in order more nearly to fit the wide range of demand in industrial medical departments.

A. The SMALL INDUSTRY with limited facilities and little demand for physical therapeutic measures.

1. *The arrangement of space.* An estimate of the types and number of cases demanding the employment of physical therapeutic measures is the first criterion in arranging for the space to be made available. In most cases a room approximating 12 ft. x 16 ft., well ventilated, and closed off from the rest of the department by a wide door (42 in.) is a minimal requirement. By the use of curtains on overhead runners or screens this room can be arranged to handle a number of cases at the same time.

2. *Equipment.* The amount of equipment for any physical therapy department should be held at a minimum in the beginning. Many pieces of apparatus can be built, such as bakers, exercise apparatus, and whirlpool baths (Fig. 1). If equipment is to be bought, recommendations of the Council on Physical Therapy should be relied upon. The amount and type of equipment will of necessity vary with each industry. To illustrate a possible arrangement of equipment in the above-mentioned space see Fig. 2.

3. *Records.* An accurate record of all cases treated in the physical therapy department should be kept, including the following data: diagnosis, location of the lesion, cause of injury, treatment — including date and number of visits, and final disposition of the case. Much of this information is of value for statistical purposes. Record keeping can become complicated and should be adapted to the ability of the staff that is responsible. The matter of keeping records will be discussed more thoroughly under II, B, 3.

B. The LARGER INDUSTRY with unlimited facilities and great demand for physical therapeutic measures.

In order to approach this subject in a concrete manner, a proposed physical therapy department within an industrial medical department supplying medical care for approximately 3000 employees is used as an example:

1. *The arrangement of space.*

An area of approximately 1029 square feet was divided into rooms (Fig. 3). One end of this floor space was fitted to be used for hydrotherapy. The remaining por-

tion was designed for other physical therapeutic procedures. These respective rooms were divided into cubicles and enclosed areas by curtains and hanging partitions (Fig. 3). The partitions were hung by brackets on the walls with a supporting leg in front to make the arrangement of space variable.

2. *Equipment.*

(a) Hydrotheraphy room:

(1) Stationary equipment:

(a) Full length bath tub and shower.

(b) Arm soak sinks.

(c) Contrast baths.

(2) Portable equipment:

(a) Two whirlpool baths (one arm and hand bath; one foot and leg bath).

(b) Easily portable massage table.

(c) Four large basins (for the application of various types of soaks and baths).

(d) Two "Cooley compresses," (a trade name of a rheostatically controlled, thermometrically gauged, rubber incased, shock proof heating pad).

(b) The room used for other therapeutic procedures:

(1) A plinth and chair in each cubicle. (The plinth should have shelves, built in, for storage of linens and other supplies.)

(2) Three infra-red generators.

(a) One non-luminous lamp.

(b) One luminous lamp.

(c) One luminous body baker.

(3) Two ultra-violet lamps.

(a) One for local application to small areas.

(b) One for general irradiations.

(4) One short wave diathermy machine.

(5) Wall plate (electro diagnosis, electrochemical procedures).

(6) Exercise apparatus.

(a) Posture mirror.

(b) Shoulder ladder.

(c) Shoulder wheel.

(d) Exercise mat.

(e) Stall bars.

(f) A hand, wrist and elbow exercising table. (Kanavel.)

(7) Interval timers in each cubicle and for each hydrotherapeutic procedure.

(c) Utility Room

(1) Small desk

(2) Files

(3) Work shelf

(4) Storage shelves

(5) Sink

(6) Paraffin bath equipment

(d) Toilet and dressing room, with two small lockers. The equipment listed above can be arranged in this physical therapy department as shown in Fig. 4.

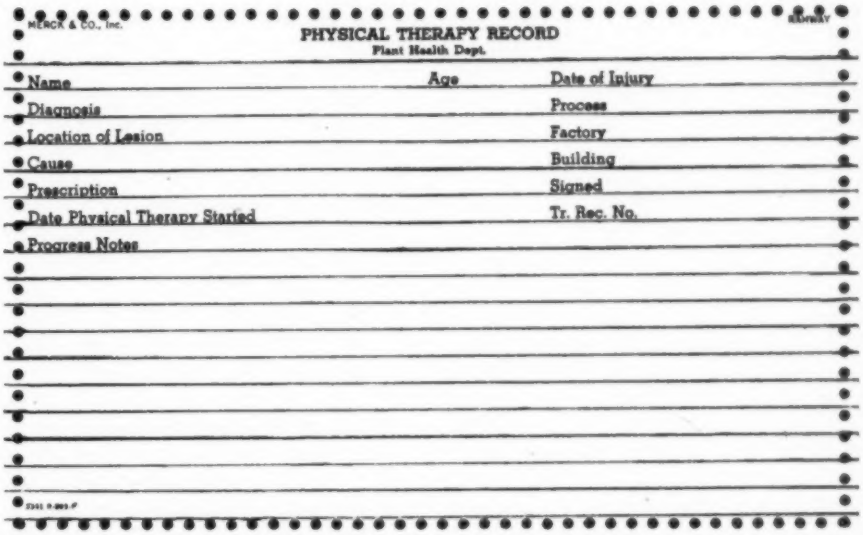
3. *Records.*

(a) Daily Schedules—A Daily Appointment Schedule is kept, showing the name and department of each individual treated, and the type and time of treatment. If any subsequent visit is desired, the patient is given an appointment on the schedule for that day. These schedules can be used for summaries on a weekly, monthly or yearly basis.

(b) Statistical Records—a Physical Therapy Record (Fig. 5) is made active on the first visit of the patient. It includes the name, age, diagnosis, location of the lesion, cause of injury, date of injury, department in which the injury occurred, prescription, signature of prescribing physician, date physical therapy was instituted and progress notes. These data are on one side of the card. On the reverse side of the card is a space for change of prescription, daily revisit record and final disposition of the case.

These cards are so designed that a punch-out system can be used to identify the cases as to diagnosis, location of the lesion, cause of injury and prescription carried out. A guide card is used in conjunction with the physical therapy records mentioned above. These are marks along the border of this guide card to correspond with the perforation on the border of the physical therapy record. Each one of these marks has a title. One border is used for the diagnostic classification, one is used for the cause of the injury, one is used for location of the lesion and the remaining border is used for the treatment prescribed and applied.

Upon the patient's first visit to the department this physical therapy record is prepared. The perforation on the physical therapy record that corresponds with the indicated mark on the guide card


MERCK & CO., Inc. REVISED

PHYSICAL THERAPY RECORD

Plant Health Dept.

Name Age Date of Injury

Diagnosis Process

Location of Lesion Factory

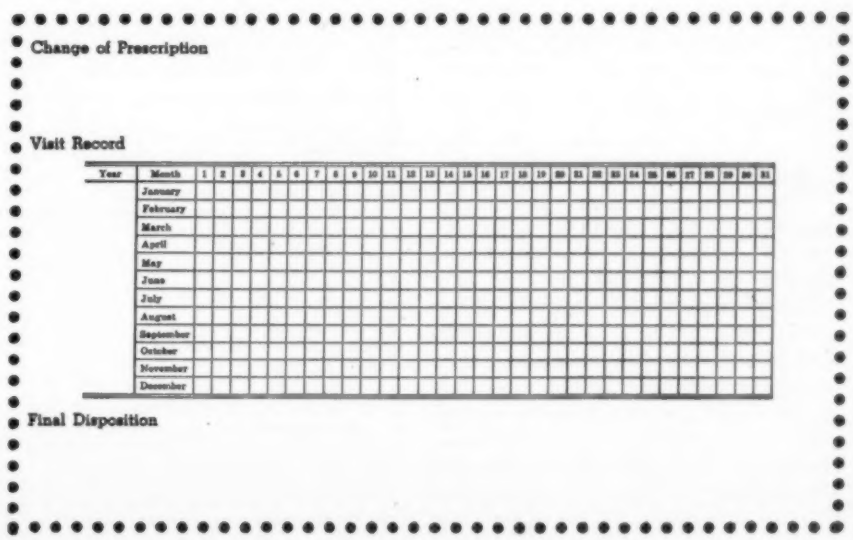
Cause Building

Prescription Signed

Date Physical Therapy Started Tr. Rec. No.

Progress Notes

Fig. 5


Change of Prescription

Visit Record

Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	January																															
	February																															
	March																															
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	June																															
	July																															
	August																															
	September																															
	October																															
	November																															
	December																															

Final Disposition

is punched out through the border in each of the four classifications mentioned above.

When the patient is discharged and the case closed this record is placed in a "closed" case file. If so desired, 25 to 30 of these cards can be separated into various groups in a very short time by thrusting a pin five inches long through the perforations corresponding to the desired classification on the guide and shaking the stack of cards loosely. The cards which have had the perforation in that location carried out through border will then fall from the group.

Many cases can be separated as to diagnosis, treatment, location of the lesion and cause of the injury, quickly and satisfactorily, for statistical purposes in this manner.

Administration

PERSONAL (A): 1. Medical. The most important part of a successful physical therapy department is its intelligent medical guidance.[1] The physician prescribing physical therapeutic measures should at least know the indications for and the contra-indications of these procedures. Preferably, the physician should know in addition the methods of application of all the measures at hand. After proper physical examination and diagnosis, the physician should prescribe by written order.

2. Technical.

A department in a small industry that treats but a few cases with physical therapy measures is usually well managed by the industrial nurse who, through special training or experience, has proved herself capable of handling this work. However, if the department is large and requires full-time attendance, it is best to have a well-trained physical therapy technician in charge. The technician is trained and experienced in this specific field and is better equipped to judge the progress of the patient and the manipulation of the apparatus.

METHOD (B): After the physician has examined the patient he prescribes the physical measures to be instituted. No treatment should be given in the physical therapy department without a prescription. If there is no physician in attendance at all times, then standing orders issued and approved by the physician in charge for the application of physical measures to minor injuries should be posted.

The progress in recovery and rehabilitation of these patients should be closely observed by the physician and technician. By close cooperation between the medical and technical staff, a better management of each case is assured. By proper coordination of occupational therapy and physical therapy, a more rapid return of the injured workman to a productive job is attained. Most industrial plants have a form of occupational therapy in operation and most programs of rehabilitation could be fitted into this plan.

The most practical way to operate a revisit schedule is by definite appointment. When the worker is carrying on his regular job or "readjusting work" work, he is able, in most cases, to be released from his job at a certain time by relief or completion of a piece of work if the foreman, group leader or supervisor is notified 24 hours in advance. The physical therapy department then can operate on a daily schedule with a minimum of waste time and a maximum of efficiency.

All of the cases, except in a few minor conditions, should have a closure examination when physical therapeutic procedures are discontinued. When this is completed, the patient's record should be so marked and placed in a closed case file. This closed case file is a valuable source of statistics in this specialized field.

COST (C): The large department used as an example above gives an average of 1700 treatments to 900 patient visits a month. This requires the services of two technicians under the supervision of the medical staff of the plant health department. A statistical report of this department is given below.

Function

A PHYSICAL THERAPY department in a plant medical division can be made or broken by the medical or technical staff. Most failures are due to an incompetent or disinterested staff, allowing the department to become a catch-all for malingerers or "compensation neurotics" or an appeasement center for the maladjusted. On the other hand, most successful departments are well organized and adequately staffed with an informed, competent, interested personnel, thus making the department an asset in many ways. In such a department all hydrotherapeutic procedures can be taken care of, relieving the dispensary of long duration soaks, compresses, wet dressing, neutralizing or thermal baths for chemical or thermal burns, and all such procedures that belong in the physical therapy unit. The convalescent period of many traumatic injuries is greatly reduced, and hospitalization of many cases is avoided by having physical therapy facilities immediately available.

Bibliography

1. KRUSEN, F. H.: Physical Medicine, W. B. Saunders Co., Philadelphia and London—1941.
2. Council on Physical Therapy of the A.M.A., Apparatus Accepted, A.M.A., 535 N. Dearborn Street, Chicago, Illinois.

Physical Therapy Statistics

IN A TWO-MONTH'S period (9/1/43—10/30/43) the physical therapy department released as asymptomatic, with good end results, 128 cases. The following information shows the type case treated and the comparative cost of treating these cases outside of the Plant Health Department:

TYPE CASES	NUMBER
Fractures	3
Abrasions	2
Contusions and abrasions	7
Contusions	18
Strains	48
Sprains	7
Dermatitis	11
Myositis	10
Infections	3
Chest irritation	3
Burns	3
Miscellaneous	13
Total	128

TREATMENT	NUMBER			COST
Infra-red	95	@	$3.00	$ 285.00
Infra-red and massage	300	@	3.00	900.00
Infra-red massage and corrective exercise	273	@	4.00	1,092.00
Shortwave diathermy, massages and exercise	20	@	4.00	80.00
Ultra-violet irradiation	31	@	3.00	93.00
Contrast baths	41	@	3.00	123.00
Domeboro soaks	9	@	5.00	45.00
Whirlpool baths	134	@	3.00	402.00
Magnesium sulfate soaks	51	@	2.00	102.00
Sodium thiosulfate soaks	37	@	2.00	74.00
Cooley compresses	41	@	5.00	205.00
TOTAL	1,032			$3,401.00

Average cost per case $26.38* Average cost per visit $3.28

*The average cost per case as shown here was computed on the basis of the charge that would be made if the patient were sent to an outside clinic for treatment. Actually if we sent these patients outside, the cost would be greater as we would have to transport them or pay for their transportation, and, in addition, there would be greater loss of time from work.

The approximate cost of operation of this department during this period was $970.00. These figures illustrate a savings of $2,431.

Vision and Accident Repeaters

—In One Industry—

JAMES H. BIRAM, M.D.,
Medical Director,
and
PRESTON N. BARTON, M.D.,
Assistant Medical Director,
Colt's Patent Fire Arms Manufacturing Company,
Hartford, Connecticut

OUR real interest in eyes began in January, 1943, when, returning from the Congress on Industrial Health in Chicago, it was my good fortune to sit up most of the night talking with MR. CHARLES P. TOLMAN about eyes.

How much work we could save ourselves if we did not listen to kindly enthusiasts!

But how much that is interesting and profitable we might overlook!

Of course, we knew something about vision, lighting, and protection, but outside of that, eyes to us were catch basins for anything flying loose around the plant. The effects of depth perception, phorias, etc., on quality of work or on accidents were hardly thought of by us.

Through the good efforts of MR. CHARLES P. TOLMAN, Consulting Engineer, National Society for The Prevention of Blindness, New York, and DR. ALBERT S. GRAY, Director of Industrial Hygiene, State of Connecticut, we were able to secure DR. LO PRESTI of the U. S. Public Health Service for about six weeks to investigate lighting and vision in regard to work inspection.

We became quite interested at that time in the Industrial Visual Testing Device with the Vectograph Target, and, through the cooperation of DR. STORY and DR. FREEMAN, of the American Optical Company, we were able to secure the loan of their experimental model to carry out some work we had in mind.

One study which interested us was the relation of eyes to accident repeaters, and the following is the result of our study and observations.

Selection of Cases

THE accident repeaters were located by a search of our medical record files. One hundred and twenty patients were found who had had an average of one or more accidents per month over a period of not less than nine months. Entries for slivers and rashes were not considered as accidents for this study. These cases were called in specifically for the eye examination. A graph showing the frequency of accidents in this group is presented (see below). The frequency range runs from one to over four and a half accidents per month, with the mean frequency about one and a half accidents per month.

The two control groups were obtained by calling in all the employees in three general machine departments. These were sent in systematically from their departments in such a way that virtually all the employees of these departments were examined. The accident records of these employees were then obtained from our medical files and the group was divided on the basis of accident frequency into two equal groups of 120 cases each.

In calling in employees for eye examinations systematically from their departments, we found 40 cases that we had previously examined as accident repeaters. Thus, to obtain the two control groups of 120 cases each, a total of 280 employees were processed. One is able to calculate from this that one case out of seven of the employees of the departments used for control cases was considered as an accident repeater. This ratio of 1:7 must be remembered in comparing the findings of the three test groups.

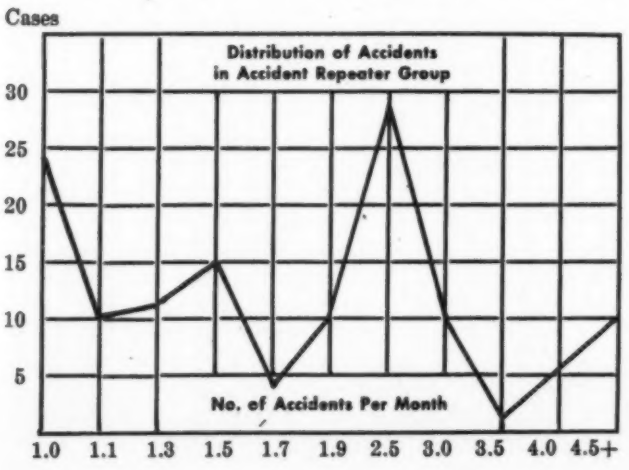
It will be seen from the accompanying graph below that in Control Group I, 57 had had no accidents recorded during the term of their employment. The remainder of Control Group I had an average of two-tenths of one accident per month or less.

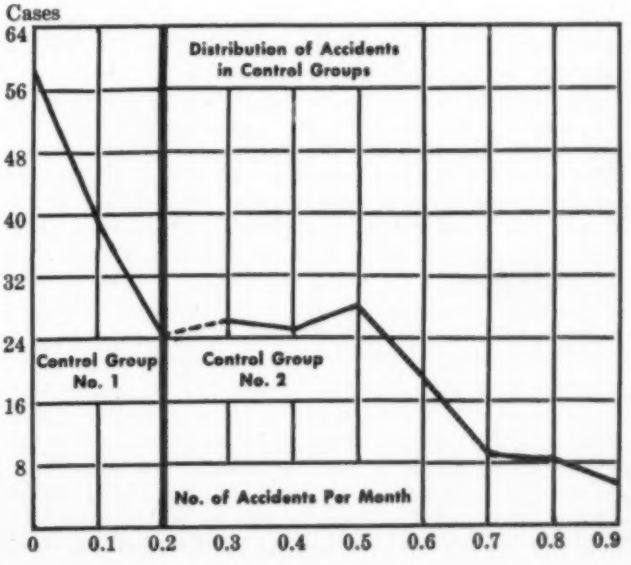
Control Group II averaged from 0.3 to 0.9 accidents per month.

A comparison of the occupational distribution of the three groups tested will show them to be relatively comparable as to their exposure to accidents:

WORK DISTRIBUTION

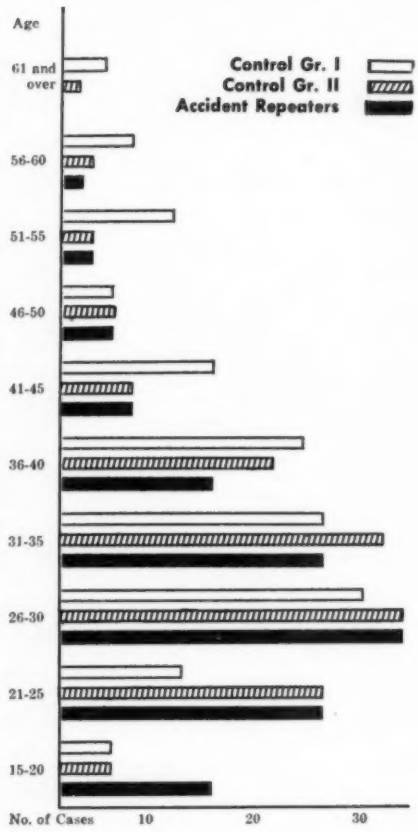
Type of Work	Accident Repeaters	Average No. Accidents	Less than Aver. No. Accidents
Power millers	26	27	32
Hand millers	3	14	9
Spline millers	4	0	0
Drill press	12	22	20
Grinders	6	7	8
Barrell drillers	2	2	0
Screw machines	2	1	1
Turret lathes	5	4	1
Shavers	1	2	5
Profilers	10	11	6
Inspectors	5	0	2
Clerks	0	2	0
Supervisory	7	6	10
Filers	5	8	8
Truckers	7	1	0
Maintenance: el'tri'ns, etc.	2	1	0
Toolmakers	3	2	0
Lathe hands	1	5	3
Reamers	2	0	7
Polishers	2	0	2
Other	15	5	6





Age Distribution

THE age-distribution graph shows that the accident repeater group was younger than the two control groups, and that the cases constituting Control Group I who had less than average number of accidents are older, on the whole, than those in Control Group II.



Sex Distribution

IT WILL be seen from the accompanying graph that there were considerably fewer women in the Accident Repeater Group. There were more women in Control Group II than in Control Group I, but this difference is very slight.

Method of Testing

THE eye examinations carried out for this study were done by a physician using an experimental model of the American Optical Company's Industrial Testing Device with Vectograph Target. This instrument utilizes the principle of polarized light to produce a binocular effect. The instrument provides a testing target that includes light sensitivity, simultaneous binocular vision, an acuity test for each eye separately, and for both eyes together, stereopsis up to 75% of theoretical maximum, and lateral and vertical phorias. All these tests can be carried out for both distant and near (14 in.) vision. All these tests were recorded on special Visual Record Cards designed for our use by the American Optical Company.

Two items of the above tests are not recorded in this study; they are light sensitivity and vertical phorias.

No attempt was made to stay on any time schedule in doing these tests, sufficient time being taken with each case to obtain an accurate result. The average time needed per case was about 15 minutes, although in many instances a satisfactory test could be obtained in five minutes, and in some cases because of low intelligence or poor literacy, the test took as long as 30 minutes.

The two items that gave most difficulty in testing were stereopsis and lateral phorias. It was found that the instrument itself on the whole was very satisfactory from the examiner's standpoint, but precautions were necessary, particularly in testing acuity. The polarized target screen was found to be not perfectly polarized, with the result that the acuity in a man's worse eye was sometimes found to be better than it actually was. This is due to the fact that the test for the left eye can be read by the right eye down as far as 20/50 in some instances and *vice versa*, but for screening this is of no concern, since the critical, that is the smaller, elements are not subject to this peculiarity. In screening, even if an eye tested as well as 20/40 (though it were really worse), we would consider referral for refraction.

There was some difficulty experienced in testing phorias in cases where there was impaired vision of either the right or left eye. In most instances, however, where the vision was better than 20/50 the test could be satisfactorily carried out by increasing the intensity of light on the target until the patient understood what he was supposed to see.

We understand that the defects which caused us trouble in the experimental model we used have been overcome largely by further research and development of this instrument.

Results of Tests

SIMULTANEOUS BINOCULAR VISION: Most of the cases examined in all three groups had simultaneous binocular vision. In the accident repeater group there were 12 cases with suppression of simultaneous binocular vision, or 10%; in Control Group II, six cases with suppression, and in Control Group I, two cases —or eight cases in all, representing an average of 3.3%.

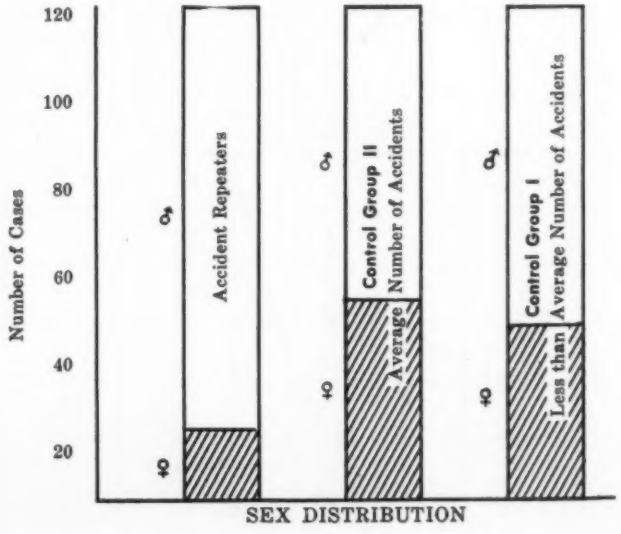
If this factor were used on pre-placement examinations, one would be able to compute that 10 out of every 100 accident repeaters examined could be eliminated. At the same time, that 100 accident repeaters were examined, one would anticipate examining 600 non-accident repeaters. Thus, 3.3% of this 600, or about 20 non-accident repeaters, would be rejected.

This is a 1:2 ratio, and many may feel that this is a reasonable basis for either the rejection of the pre-placement candidates who have suppression of binocular vision, or their placement on non-hazardous work. Using this criterion, one would increase their rejection rate by as much as 4.3%.

BINOCULAR VISION: FAR

	Accident Repeaters	Control Group No. 2	Control Group No. 1
Simultaneous	108	114	118
Right eye	5	3	1
Left eye	3	1	1
Alternation	4	2	0

VISUAL ACUITY: The accompanying charts show an inverse correlation between normal 20/20 vision and accidents. This, however, can undoubtedly be ex-



BINOCULAR ACUITY

	Accident Repeaters	Control Group No. 2	Control Group No. 1
BOTH NEAR			
20/20	96	92	79
20/30	18	22	27
20/40	5	2	9
20/50	0	2	5
20/70	1	2	0
20/100	0	0	0
20/200	0	0	0
BOTH FAR			
20/20	95	90	82
20/30	20	25	34
20/40	3	4	4
20/50	0	1	0
20/70	0	0	0
20/100	0	0	0
20/200	0	0	0

	Accident Repeaters	Control Group No. 2	Control Group No. 1
OD NEAR			
20/20	81	74	52
20/30	25	32	41
20/40	10	7	15
20/50	1	3	8
20/70	2	1	3
20/100	1	2	1
20/200	0	1	1
OD FAR			
20/20	73	65	51
20/30	36	36	56
20/40	7	13	9
20/50	3	5	3
20/70	1	0	1
20/100	0	0	0
20/200	0	1	0

	Accident Repeaters	Control Group No. 2	Control Group No. 1
OS NEAR			
20/20	78	64	59
20/30	27	46	37
20/40	5	4	14
20/50	6	1	4
20/70	3	2	6
20/100	0	2	0
20/200	1	1	0
OS FAR			
20/20	67	54	37
20/30	35	45	63
20/40	8	12	16
20/50	7	4	2
20/70	2	3	2
20/100	0	1	0
20/200	1	1	0

plained on the basis that the average age of the cases that constitute the control groups was somewhat greater than that of the accident repeater group, and thus the variation in the groups can probably be explained on the basis of this age difference.

If cases with binocular visual acuity of 20/40, and better, are compared in the three groups, there will be seen differences no greater than one would expect through error—a maximum variation of four in the three groups of 120 cases. In the acuities of each eye compared the same way, the maximum variation is only eight cases, and there is no consistent trend in the variations.

STEREOPSIS (DEPTH PERCEPTION): It has been thought by many that a person with impaired depth perception should be more prone to accidents.

This would seem logical, because, if a man has difficulty judging distances, he should be more apt to get into trouble. This study showed a slightly positive correlation between normal depth perception and freedom from accidents.

On distance stereopsis 55 accident repeaters, or 46.6%, failed to reach 75% of theoretical maximum; Control Group II, 45 cases, or 37.5%; and in Control Group I, 38 cases, or 31.6%.

On near stereopsis, 41, or 34.2% failed; Control Group II, 28, or 23.3% failed, and in Control Group I, 33, or 27.5%, failed.

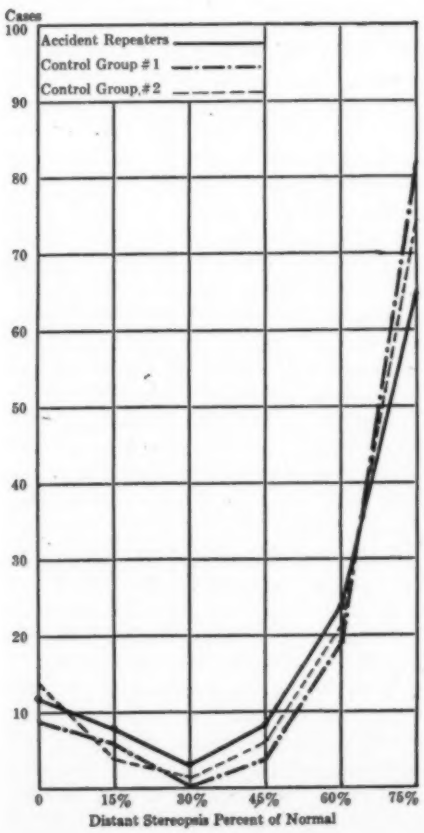
The combined average of the control groups on the distant test is 34.5%, and for the near test it is 25.4%.

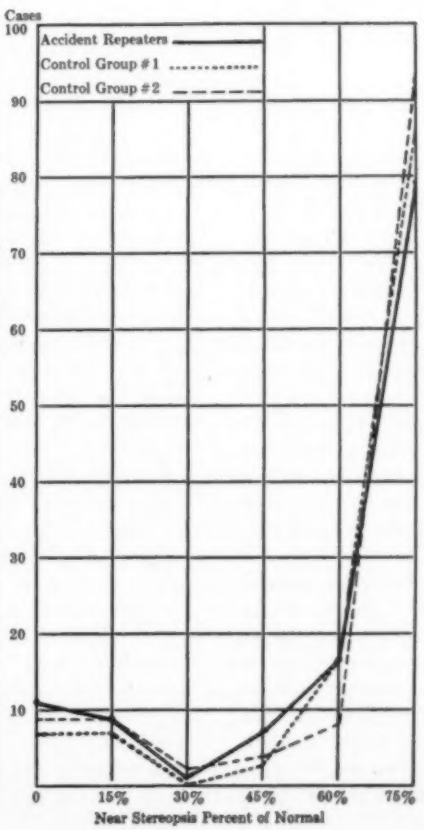
DISTANT STEREOPSIS FAILURES TO REACH 75% OF THEORETICAL MAXIMUM

	Accident Repeaters	Control Group No. II	Control Group No. I	Combined Control Groups
% Failures	46.6%	37.5%	31.6%	34.6%
No. Cases	55	45	38	83

NEAR STEREOPSIS FAILURES TO REACH 75% OF THEORETICAL MAXIMUM

	Accident Repeaters	Control Group No. II	Control Group No. I	Combined Control Groups
% Failures	34.2%	23.3%	27.5%	25.4%
No. Cases	41	28	33	61





On applying these percentages on pre-placement candidates one would expect to get the following results: 34 potential accident repeaters could be eliminated on the near stereopsis and, at the same time, 25.6 x 600, or 152, non-accident repeaters would be lost; one would lose 4.4 good candidates for each accident repeater eliminated; the ratio for distant stereopsis would be 1:3.8 and would increase rejection rates by as much as 26.5% of all pre-placement candidates.

PHORIAS: Only horizontal phorias were considered in this study. Approximately one-half of the patients in each of the three groups showed an exophoria for near vision. About 20% of the patients who had an exophoria for near vision also had one for distant vision. Of those who had an exophoria for distant vision there were three times as many (18) in the accident repeater group. There was no significant difference between the three groups in the number with exophoria for near vision.

DISTANCE EXOPHORIAS				
	Accident Repeaters	Control Group No. II	Control Group No. I	Combined Control Groups
No. Cases	18	11	6	17
% of Group	15%	9%	5%	7%

Calculations from the above table will show that 15 out of every 100 accident repeaters could be eliminated. At the same time one would lose 42 non-accident repeaters. This gives a ratio of 1:2.8 and would add to a rejection rate percentage as much as 8.1%.

It is interesting to note that a great many cases who had exophoria had at one time or another been given so-called "rest glasses" for symptoms of eye-strain. Most of these glasses were merely tinted lenses and many of them at the time of the test were no longer being worn. The usual statement was their "glasses did not help."

Gross tests for convergence were given in most of these cases and, if they had symptoms of eye-strain and a poor convergence, convergence exercises were given them with apparent beneficial results for the symptoms of eye-strain, but in the few cases so far re-tested, there was no appreciable change in the extent of their exophoria. It was the usual situation that the patients with uncorrected acuity had no symptoms of eye-strain, whereas those with an exophoria, even with normal acuity in both eyes, had relatively severe symptoms of eye-strain.

Esophoria was exhibited in too few cases to be considered statistically valid in this study. However, there is a 4 to 1 relative incidence of near esophoria between the accident repeater groups and combined control groups. This, if confirmed by other studies, might be considered a reasonable basis for elimination of accident repeaters, but would screen out only 3% of the total.

PHORIAS: (LATERAL)			
NEAR			
	Accident Repeaters	Control Group No. 2	Control Group No. 1
Esophoric	4	2	0
Orthophoric	52	60	58
Exophoric	64	58	62
FAR			
Esophoric	5	3	7
Orthophoric	97	106	107
Exophoric	18	11	6

Discussion

FROM these studies we have come to the conclusion that there is some correlation between the following visual defects and the accident prone worker, namely, suppression of simultaneous binocular vision, impaired stereopsis, exophorias on distant vision, and esophorias on near vision.

We feel, however, that these factors alone do not justify the rejection of a worker for a hazardous job, but that they might have a place in combination with dexterity and other psychological tests which alone have not proved too successful in determining such placement.

We are convinced that, because of the large number of correctable defects found in this study, it was worthwhile to the employees. They were grateful for the examination and, in most instances, carried out the recommendations regarding corrections. Because of this, we are continuing the examinations and plan to examine all our employees.

We find that within a week a nurse becomes reasonably proficient in the operation of this device. There are some features of the experimental model that might be improved on, but we understand that this has largely been taken care of in the finished product. In our hands it has proved most satisfactory, and we feel that this light, accurate portable instrument will be of great use to industry.

War-Engendered Psychiatric Problems

—In Industrial Medicine—

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THE WAR has brought to industries, particularly those engaged in war production, many workers unused to the speed, precision and pressure of the accelerated war effort. Higher wages have attracted to these factories workers accustomed to lower income. Patriotism and other motives have encouraged individuals suffering from chronic partially invaliding diseases to attempt to fill positions they would ordinarily consider beyond their physical or mental capabilities. The need for more and more workers has prompted personnel offices to waive defects and to employ persons who in normal times would have been disqualified. In behalf of the great majority of war workers it must be said that these cases are in the minority and are not made up of that great backbone of industry which constitutes oragnized labor. However, the cases with which we are concerned are the cases which cause trouble. As the result of this great industrial expansion the employment of physically and mentally defective individuals reached a peak from which a decline may be predicted on the basis of the gradual weeding out of the unfit as decreased volume of production of war materials becomes inevitable. In other cases the unfit will be replaced by more physically and mentally fit discharged service personnel. The recommendation for continuing employment of a psychiatric patient frequently must become the responsibility of the medical consultant. As Selling states,[4] "Sometimes these problems will be so great that the expert psychiatrist who has had some experience in industry will have to be called upon to act as consultant."

In a recent conference with a group of psychiatric consultants serving part time on the medical staffs of several aircraft factories the discussion centered upon the employment of epileptic patients. Some personnel managers question the advisability of employing known epileptics in any capacity. However good use can be made of many epileptics by their employment in certain carefully selected positions where nothing will be jeopardized by the occasional convulsive episode. Many plants are making use of such patients. We have seen a number of mental patients under private psychiatric care who had not worked for several years prior to the war, and who are now employed in very productive capacities in war plants, filling positions that might be unfilled otherwise.

The expansion of our military services and the mechanism of Selective Service have made such employment of chronically ill persons more and more essential. A patient with dementia praecox is riveting in an airplane factory. An epileptic patient is checking inventories at a desk at another factory. A woman with involutional paranoia works in a plant cafeteria. A man with a psychoneurotic depression is tool checker. Cases could be multipled indefinitely. These patients

are under treatment, are under control, and are known to the plant physicians who confer with the private physician periodically. When a relapse becomes too marked the patient is removed temporarily. These individuals are unfit, but they are necessarily doing the work that the fit would do if they were here to do it. Again it must be remembered we are speaking of this small unfit minority.

In this discussion we do not wish to consider those mental illnesses that would ordinarily reach a critical stage no matter what conditions existed, but to discuss only those cases in which war-engendered problems seem to be major precipitating factors. Among war workers there is no evidence that war is a fundamental or primary cause of mental illness. It must be emphasized that the war seems to enhance the possibilities of breakdown in individuals who were predisposed to breakdown in the first place. In the military services there have been noted considerable numbers of young men and women, in their late teens or early twenties, who suffer mental breakdowns within a very short time after enlistment, often within a few days to a few weeks.[5] Most of these cases suffered their psychiatric breakdown shortly after reaching training camp. The largest percentage were found to be suffering from schizophrenia, a smaller percentage from psychoneuroses, particularly anxiety neurosis. In social service follow-ups it was interesting to note the frequency with which relatives stated the patients were normal before entry into the service. Investigation usually revealed, however, that their neighbors, teachers and associates at home had found them rather marked deviates from the normal. These were, then, cases of latent or incipient mental illness that were taken into the military services without having been recognized, and which, under the stress of military life, discipline and merciless personality assault by their fellows, developed acute flare-ups of the already existing mental illness, resulting in the necessity for hospitalization. It is important to prevent such cases from getting into environmental situations with which they cannot cope. The military service does not make a man of such a patient. It makes him a psychiatric casualty. Selective Service implies the selection of fit men for service and men fit for the service.

Such individuals remaining in the community, having incipient or latent mental illness represent a potential hazard for the industry which employs them in positions for which they are not adapted. In such maladjusted employment situations they may be as predisposed to mental breakdown as they would be in the maladjustment situation constituted by the military service. Selective Service in industry is as essential, from the psychiatric standpoint, as it is for the military service. These patients having incipient or latent mental illness are the vulnerable ones in any community. Trouble and strife, grief and worry, trial and stress cause them to have acute exacerbations of their already existing latent mental disorders, or the same type of exacerbation may occur in a pre-existing chronic mild mental disorder with resulting necessary hospitalization.

A patient here two weeks from another state was brought to the hospital where he was seen suffering from an acute delirium. When he had improved he stated as his own opinion that he could get along on the farm but that the speed of this war work threw him into an acute confusion. He suffers from chronic mild schizophrenia and is poorly adaptable to rapid environmental changes.

An office secretary was brought to the hospital after having assaulted her supervisor because she thought the latter had conspired with the other girls to ridicule her and that they were making obscene remarks about her. History revealed she had been hearing voices for years but had gotten along until excessive working hours with resulting fatigue had let her slip from control. This is another example of chronic schizophrenia, paranoid type, made worse by unfavorable working conditions.

A technician was injudiciously selected for a position in which he would be trained for executive work. History revealed he had never been able to assume responsibility. He underwent a "promotion depression" (Flannagan[3]) based upon his underlying anxiety neurosis. The fundamental personality defect became apparent when placed under stress it could not sustain. The assumption of responsibility beyond the individual's capacity is hazardous not only to the position but to the employee as well.

Another patient suffering from a psychoneurosis was forced to move into a house adjacent to a busy boulevard. The noise kept him from sleeping unless he employed alcohol as a sedative. He was admitted to the hospital with a chronic alcoholic psychosis, months of over-indulgence in his "sedative" having superadded one mental illness to another.

A patient with catatonic dementia praecox has been under treatment for several years and getting along very well in his work which he was doing before the war. He tacks moldings on window screens, and is so stimulated by the stereotypy of his work and by the pressure of his catatonic excitement that he can and does tack three to four times as many screens per day as any other worker in the division. Under constant and intensive psychiatric treatment he has been able to continue in his work for several years. His automobile is to him a substitute for a wife, and one day recently when caught in a traffic snarl coming from work his car was struck. He ran the car that struck him into the curb and started to assault the driver when the police intervened. His state of excitement continued for several weeks during which he had to be kept under sedation in bed at home.

SINCE pressure and tension situations have these effects upon the mentally ill, what are their effects on the normal or mentally stable? The results of such conditions have been worked out carefully by the Russian physiologist, Pavlov, who has shown that animals respond to stimuli which tax and strain their nervous reaction mechanisms by the development of neurotic states, during which they are unable to behave normally or to carry out acts for which they have been trained. The human animal, in spite of his higher intelligence, and perhaps in some cases because of it, responds in much the same way. Neuroses, tension states, and a series of psychosomatic illnesses may result from prolonged stress upon the relatively healthy.

The community environment is a most important condition which complicates the problems of industrial health. The efforts of the industrial hygienist to insure a safe and healthful working environment may be nullified in considerable degree by unfavorable conditions in the community. J. J. Bloomfield,[1] Sanitary Engineer of the U. S. Public Health Service, has pointed out the uneven allocation of war contracts geographically. He states that at one time 73% of the war contracts were allotted in 20 industrial centers containing 22% of the total population. In such areas, the impact has been felt not only in tremendously increased industrial activity but also in a severe strain on community facilities of all sorts—transportation, schools, hospitals and medical and public health services.

The hazards to physical health with crowding in factories, homes and transportation facilities, bringing war industries under constant threat of outbreaks of contagious disease among employees which would seriously disrupt production, are obvious to most people. Perhaps somewhat less obvious are the effects of crowding, poor housing and lack of sufficient medical facilities, schools and recreation and other welfare services, all of which combine to threaten health and to disrupt normal family life. As Bloomfield states, "If we add to these the mental strain caused by war worries, one has a situation which is certainly not conducive to good morale and all-out production. Among other factors which it is to the interest of both labor and industry to eliminate as far as possible, is fatigue, because of its effect on both physical and mental health. A worker who arrives at work tired out from the physical labor of getting to his plant is not a productive worker. The effects of fatigue, whatever its origin, are lessened production, increased labor turnover, increased accidents, absenteeism, higher compensation costs, and increased mental illness. It has been shown by studies in both Great Britain and in this country that the optimum hours of work are 48 in a six-day week for sustained production. Fatigue is frequently a result of anxiety and, in turn, it tends to stimulate further anxiety."[1]

Frequently noted among war workers is the problem of marital discord. Underlying many such cases psychiatric investigation has revealed fatigue to be a prominent cause, the discord developing out of the irritability and unreasonableness of the over-tired spouse. The intensification of minor happenings, loss of perspective and development of actual anxiety attacks on the basis of fatigue are seen frequently in the psychiatric clinic. Bloomfield has pointed out that fatigue is an important cause of breakdown in executives, being due largely to the necessity of making continual decisions and of accepting constant responsibility. The establishment of adequate numbers of assistant administrative positions is a preventive measure economically advantageous. For the worker the provision of adequate housing away from noise, in an environment conducive to rest, is a most important contribution to the elimination of fatigue. The psychological factors involved in housing shortage, transportation inadequacy and medical facilities are of the utmost importance. At an industrial public health meeting[1] the importance of the community environment was stressed:

"The disruption of community facilities is one of the many influences of war on industrial medicine; it is perhaps the first one to be felt in the industrial physician's practice and equally one of the last to be recognized. Industrial medicine can no longer confine itself to emergency treatment and the diagnosis of occupational diseases. True, there is a bigger job to be done in the plant itself—that is, a job of prevention. But even this cannot be accomplished without a prompt and responsible recognition of the influence of living conditions on absenteeism and industrial disability."

It is probable that some otherwise inevitable industrial breakdowns can be averted by the wholehearted interest of the local industry in the community environment. Cases of isolated and wholesale absenteeism have been prevented by simple mentally hygienic measures designed to make more contented employees. The reduction of complaints of employees by such measures has been shown by Dakin[2] to be 80% due to "the fact that the company is interested in their welfare and is doing something constructive about it." Two years ago a crisis in employer-employee relationships was developing rapidly in one of the largest of the war industry areas of the Pacific Coast. The problems concerned and the controversial issues involved were not at all the responsibility of the industrial plants of the area. They were community facility problems that had arisen out of the explosively rapid growth of the area—acute shortage of housing, extremely inadequate transportation facilities, interurban lines capable of hauling only about a tenth of the workers needing their facilities, highways choked with the increased loads of bus and private transportation, inter-insular bridges serving as bottlenecks for the too-narrow and too-few highways. One worker who drove 40 miles each way to work found that after working 10 hours and spending two to three hours traveling each way he had just enough time at home to sleep and eat and no time to spend with his family. His anxiety and nervous tension had almost broken up his home, and he was ready to resign from his work.

A combined employee, employer, transportation, housing meeting was called by employee representatives. A program was planned, sufficiently long range to take into account present difficulties and those that probably would develop from further industrial expansion. In addition to transportation officials, engineers, company representatives, employee representatives and public officials, psychiatric counsel was obtained. The resulting program contributed not only to efficiency in the plants of the area but undoubtedly provided in considerable measure that degree of security and satisfaction among employees which has prevented any major job layoffs in any of this group of plants during the past two years.

In holding this conference these industrial plants adopted a concept of the worker designed to keep him at his job, to assure to him conditions of living compatible with physical and mental health, and to assist him in contributing his best efforts to the job of production.

Summary

THE expansion of industry has resulted in the necessary employment of many persons with mild or latent, chronic mental disorders.

2. With the reduction in numbers of employees in war industries, the psychiatric medical consultant will prove a valuable aid in recommending those cases to be retained.

3. Chronically or latently mentally ill employees represent a potential hazard to war industry.

4. The industrial employment situation may constitute a precipitating factor for an acute exacerbation of mental illness as may the military service.

5. Mentally ill patients and those with personality disorders constitute a valuable source of labor and can be utilized when under careful psychiatric supervision and treatment.

6. "Promotion depression" constitutes a psychiatric hazard of considerable importance to industry.

7. Pressure and tension situations may arouse neurotic and psychosomatic illnesses in relatively normal employees which can be relieved by psychotherapeutic interviews at occasional intervals.

8. The community environment is an important source of potential precipitating causes of mental disorders; its psychogenic etiological factors must necessarily become the problems of the local industry.

9. Fatigue is a cause of anxiety and may cause further psychiatric difficulties. The control and prevention of fatigue follow simple principles of mental hygiene.

10. Industrial medicine must, necessarily, concern

itself with factory and community causes of mental illness, and psychiatric consultation must bear a considerable responsibility in providing a mentally hygienic community environment.

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Suggested Standing Orders and Procedures

—For Industrial First Aiders—

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THIS material was composed to provide a more substantial basis for the satisfactory performance of industrial medical care in small plants. A survey of the larger plants further indicates the necessity for orders and procedures, due to the functions and responsibilities being thrust upon the first aider under the stress of war conditions.

A distinction is necessary in speaking of the "industrial first aider." This individual is not the type ordinarily considered outside of industry. The industrial first aider may be responsible for large numbers of cases at frequent intervals and on occasion spends full time as the only on-the-spot medical aid available. This is true in many of the smaller plants which make up the vast majority of industrial organizations.

An important step is to provide a set of written orders for the emergency and temporary care of industrial injuries and illnesses. This material is meant to meet that obligation and is not intended to give a classifying description of cases. It is for the use of officially designated first aiders who have received satisfactory training and *are capable of differentiating the conditions which they may observe in order to apply the proper care.*

Definition of First Aid

FIRST AID is defined as immediate, necessary, temporary care given in case of accident or sudden illness before the services of a physician can be secured.

Qualifications of First-Aider

THE qualifications of the person directly responsible for the application of first aid in a plant are extremely important. The industrial first aider should be *trained in the standard courses given by certified instructors of the American Red Cross, Bureau of Mines, or other accredited agencies.* Additional or advanced courses are advisable. The certificate granted when the course is completed should be posted prominently in the first aid department. This should be a current certificate. A refresher course in first aid is necessary every three years.

Procedures in General

AS AN industrial first aider, realize that your authority is limited to emergency and temporary essential care. At no time should an attempt be made to treat a case beyond first aid measures, nor to advise or dispense medicine *unless authorized.* A good and refreshed knowledge of bandaging and familiarity with aseptic technique concerning the first aider's hands, instruments, and material used about the wound are essential.

RECORDS: Some simple system of record should be kept for the protection of the first aider and the patient, and for the efficient handling of cases. An example is illustrated. A brief description of circumstances and characteristics surrounding the injury or illness should be included with the description of the case and what was done. If a small first aid room is not available, these forms are best filed in the plant office and not allowed to accumulate haphazardly at the point of operation.

TRANSPORTATION: Many of the demands for your services will be away from the point where you would like to care for the case, or the patient will require moving to a hospital or doctor's office. Transportation facilities should be considered before an emergency demands them and a definite arrange-

(Letterhead of Company)

Date_____ Total Visits_____

Name	Dept.	Shift	Nature of Injury Cause of Injury	Care	To Doctor Yes	To Doctor No	Signature

Sample Day Log (Size 8½" x 11")

THIS is the text of the "Suggested Standing Orders and Procedures." In the booklet form of their publication by Liberty Mutual there will be spaces (indicated by (—) where not included here) for additions or changes by the physicians, and a chart of instructions regarding the prone pressure method of artificial respiration—together with the following, on the front cover:

Property of_____ Industrial First Aider

DOCTORS ON FACTORY CALL OR IN COMMUNITY

_____ M.D. Hrs_____ Phone_____
_____ M.D. Hrs_____ Phone_____
_____ M.D. Hrs_____ Phone_____

Note: It is recommended that your physician review this material. Space has been supplied where additions or changes can be made by the physician for further adaptation to his desires and the medical needs of your particular industry.

ment worked out with plant management.

A knowledge of how and when to lift and move the patient is implied. There are particular methods and case techniques illustrated in the various standard textbooks on first aid with which the first aider should be familiar. The classic illustration is the irreparable damage often done in the careless moving of a person with a broken neck. A witness's statement as to how the victim fell, or the site of the injury and the circumstances may give a valuable lead on how the victim should be moved.

The first aider should be familiar with the use of the usual commercial splints and also with methods of splinting for transportation in the absence of these, using newspapers, pillows, boards and pads. Suffice it to say the object in applying a splint is to immobilize the injured part. If your splint does not do this, it is useless. Although cases may generally be classified as "head injuries," "fractures," etc., nevertheless, each case varies considerably and must be treated individually because of the varying degree of shock, bleeding, and incapacity encountered. Rapid work is essential but is disastrous unless guided by cool thought—*know what you are doing*. Do not move the person until you have obtained some estimate of the kind and cause of the injury or illness. Note the exceptions under "Indications for Rapid, Immediate Care."

Rapid, Immediate Care

HEMORRHAGE: (Physician to be called at once by another person or as soon as possible.) Keep patient quiet. If severe call the physician or have another person call him.

Venous — Use direct pressure over wound with sterile dressing.

Arterial—Use pressure at pressure points. Otherwise, use direct hand pressure over sterile gauze placed on the wound. A firm, sterile bandage over the wound may suffice. On limbs, use a tourniquet as a last resort. Apply just tightly enough to stop the bleeding. Release every 15 minutes. Remove if bleeding remains stopped. Watch for shock. Do not cover the tourniquet with bandages or clothing, thus avoiding the risk of forgetting it.

ASPHYXIA (Breathing Stopped): If in a hazardous atmosphere, remove at once to fresh air. To safely remove a person discovered unconscious in a tank or other enclosure, the rescuer should enter the tank only with adequate protection to avoid being overcome himself. The rescuer should at least be secured by a life line tended by an assistant outside of the enclosure. Any available respiratory protection should also be used.

1. Start artificial respiration at once.

2. If an inhalator is available, have it put in operation as you continue your artificial respiration.

NOTE—All first aiders should be able to apply artificial respiration by the prone pressure method (see instructions, page 00).

SHOCK: Avoid delay in shock treatment.

1. Lay the person down with the head slightly lowered.

2. Maintain warmth with blankets over and under.

3. Give stimulant_____

(a) If unsconscious, crush an ammonia ampule or pour some liquid ammonia on a small square of gauze and place near patient's nose.

(b) If conscious, give aromatic spirits of ammonia by mouth. (Use one teaspoonful to one-half glass of water.)

DO NOT GIVE OTHER STIMULANTS UNLESS SPECIFICALLY ORDERED. (——)

ELECTRIC SHOCK: In rescuing an electric shock victim who is still in contact with the circuit, be sure to break the power contact in any safe but rapid manner. Use dry rope, leather belt, necktie, dry boards, or some other non-conductor, or best of all disengage the power switch if it is close by.

1. Remove from electrical contact.

2. Start artificial respiration at once if breathing has stopped.

3. Keep him lying down quietly if conscious, as exertion may involve heart failure.

POISONING: HASTE IS IMPORTANT. Quick vomiting can be brought about by putting the finger in the back of the throat. Anticipate and prepare for poisoning by industrial chemicals as suggested under "Specific Treatment."

General Treatment—Poison unknown.

1. *Dilution*—Give large quantities of water, milk or tea.

2. *Elimination.* Induce vomiting by stimulating back of throat or by giving a tablespoon of mustard in a cup of warm water.

3. *Antidote.* Whites of raw eggs (a good all-purpose antidote—2 parts charcoal, 1 part tannic acid, 1 part magnesium oxide).

Specific Treatment — Poison known. Obtain prescription for antidote, directions and authorization for use from the plant doctor.

1. *Acids*—Weak alkalies (i.e. baking soda).

2. *Alkalies*—Weak acids (i.e. vinegar).

3. *Arsenic* — Magnesium oxide and ferric chloride solution.

4. *Phosphorus* — Cupric sulfate or potassium permanganate solution.

5. *Formaldehyde* — Ammonium carbonate.

6. *Mercuric salts*—Sodium thiosulfate.

7. *Barium*—Epsom salts.

8. *Hydrocyanic Acid*—Use arsenic antidote.

WOUNDS: Inspect and come to some opinion regarding the type, extent, condition and importance of every wound. This will determine:

1. The necessity for immediate first aid care.

2. The type of first aid care to be given.

3. The possibility of important tissue damage (nerves, tendons, eyelids, eyes, etc.).

4. The presence of infection.

5. The desirability of early reference to a physician.

First Aid Care of Wounds

IF GROSSLY dirty cover the wound with sterile gauze and clean (preferably with alcohol), working away from the gauze edge. (——)

2. Apply antiseptic of physician's choice—only once. (——)

3. Apply a dry sterile gauze dressing.

4. The first aider should *NOT* do more than what has been authorized.

5. Refer to the physician for tetanus antitoxin:

(a) Wounds contaminated with soil, particularly that upon which animal fertilizer may have been used at any time in the past.

(b) Puncture wounds from rusty objects.

(c) Contaminated crushing injuries.

6. Remember the possibility of damage to important deep tissues (tendons, nerves, etc.) from lacerations and puncture wounds. REFER TO THE PHYSICIAN ALL CASES SPECIFIED BY HIM. (——)

Abrasions—Follow above directions.

Incisions—Control bleeding and follow above directions.

Lacerations — Control bleeding and follow above directions. These wounds are particularly susceptible to infection.

Puncture Wounds—Clean and

apply dressing as directed. Refer to physician. These wounds are particularly prone to result in tetanus.

Bruises—Apply cold compresses for 24 hours, then warm ones. A blow on the eyeball may cause a hemorrhage inside of the eye. If there is blurring or any complaint as to visual defect, consider this an indication for reference to a physician.

INFECTED WOUNDS: Be aware that serious infection may take the form of a firm, red swelling *without pus*. Rarely red streaks may also be seen leading away from the wound. Clean pus from obviously uninjured skin. Do not clean, probe, or attempt any form of debridement of the wound itself. Where skin is unbroken (example —infected hangnail) give hot Epsom salts soak. Use two tablespoonsful to a pint of warm, nearly hot, water. The above measures are temporary only. These cases must be referred to the physician as soon as possible. (——)

SLIVERS AND SPLINTERS: Only entirely superficial slivers and splinters which can be easily removed should be taken out by the first aider after applying an antiseptic. Use small forceps which have been sterilized by heat or cleaned with antiseptic solution. Clean and apply dressing as directed. Refer to physician all slivers or splinters that are EMBEDDED.

BURNS: (1) *Small Area (1-2 inches) and Superficial (1st or 2nd degree) Burns*—If grossly dirty, clean and apply white vaseline or

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Bandage firmly. *Leave blisters alone.* (——)

2. *Large Area and Third Degree Burns.*

(a) Call a physician.

(b) Cover the burned area with a sheet wet with lukewarm soda bicarbonate solution. (Use 3 tablespoonsful to one quart of warm water.)

(c) Treat for shock.

NEVER APPLY IODINE OR ANY ANTISEPTIC TO BURNS.

3. *Chemical Burns*—Flush freely with large quantities of water. Cover with a sterile dressing. Refer particularly large area burns and important structure burns to a physician.

4. *Sunburn* — Should not be treated in the plant first aid. Refer to a physician.

SPRAINS: Apply cold compresses; elevate the part. Unless pain leaves and complete functional ability returns in a short time, refer to a physician. A firm, adhesive strapping may be of aid, as in back, knee and ankle sprains, in supporting the injured joint until the physician can see the case. (——)

STRAINS: Apply warm applications and rest of injured part. Refer to a physician. (——)

[NOTE—The possibility of a fracture or other serious deep tissue injury necessitates the reference of sprains and strains to a physician.]

FRACTURES AND DISLOCATIONS:

1. Splint before moving.
2. Call a physician or ambulance.
3. Treat for shock.
4. Make the patient comfortable.
5. Immobilize or splint.
6. If the bone protrudes, cover with a dry, sterile dressing. Do not attempt to put it back under the skin, and splint the part so that it will not go back of is own accord and cause deep wound contamination.

DO NO MORE THAN IS AUTHORIZED.

Cases Which May Be Moved Before Splinting—Nose, fingers, small bones of foot if crutch or transportation aid is available. Fractures where limited bodily movement away from the break is of little concern.

Refer injuries where a fracture is not obvious but the injuring force was strong to the doctor for examination and x-ray. Incomplete dislocations where the person states that the joint "snapped" or was pulled back into position should also be referred, as the bone may be chipped.

EYES: (1) *Foreign Bodies in the Eyes*—The use of a magnifying lens or lenses and a bright light used from various angles (i.e., a penlight) is recommended. After looking over the eyeball for the foreign body, look at the lower lid by holding down the skin of the lid and having the person look up. Hold the upper lid out by the lashes and look under at the back surface. No more than this should be attempted unless specific instruction have been given or unless under the immediate supervision of the physician. (——)

The first aider should attempt to remove only those foreign bodies which can be seen to be "floating" or lying free. Flush the foreign body out with warm boric acid solution. Use a sterile syringe each time. This method should be used particularly for foreign bodies standing on the clear (corneal) or white (conjunctival) part of the eyeball. If still present but *only* when on the back edge of the lids, use a sterile soft cotton applicator moistened in boric acid solution or clean water. No pressure is needed; be gentle. Use a rolling motion. If it remains, STOP—it is embedded. Refer all persistent or embedded foreign bodies on the eyeball or lids to the physician immediately.

Depending upon the type of work being done when the accident happened, an x-ray may be indicated to rule out the possibility of a small chip of metal being inside the eyeball. A flying flake of steel may leave only a tiny, scratch-like external wound. (——)

2. *Chemical Burns of the Eye*—Flush out immediately and repeatedly with plenty of water. Cover with sterile pad and refer to physician. (——)

3. *Hot Metal Burns*—Cover with sterile gauze pad and refer to physicians.

4. *"Flash Burn" (Eye Exposure to the Welding Arc)*—Cold compresses give temporary relief. Refer to physician for anesthetic eye drops.

5. *Eye Inflammation or Eye Discharge*—Refer to physician at once. (——)

HEAD: (1) *Head Injuries With Lacerations.*

(a) Cover injury with sterile gauze. Bandage with pressure *only* when bleeding is profuse and continuous.

(b) Lay patient down with head elevated. Keep him quiet. Cold compresses should be applied to the head away from site of laceration. Otherwise, keep him warm.

(c) Call physician.

(d) Give no stimulants.

(e) Take pulse and respiration. (——)

2. *Head Injuries Without Lacerations.*

(a) Lay patient down with head elevated. Keep him quiet.

(b) Call the physician.

(c) Apply cold compresses to the head; otherwise keep him warm.

(d) Give no stimulants.

(e) Observe pulse and respiration. (——)

CHEST: Chest and abdominal injuries may result in damage to internal organs with or without external evidence of injury. Following a hard blow to the body, though the case is ambulatory and shows no immediate marked degree of pain or incapacity, advise a physician's examination.

For serious cases:

1. Keep patient warm and quiet.
2. Give nothing by mouth.
3. Call the physician.
4. Transport on stretcher to physician or hospital. (——)

HEAT: If working long periods in heat is required, facilities for

an adequate salt and fluid intake should be set up for convenient access. Such workers should take salt tablets every day (a tablet with a glass of water).

HEAT EXHAUSTION: (1) Remove to circulating air and lay patient down with head slightly lowered.

2. Keep patient warm.

3. If conscious:

(a) Stimulant — Teaspoonful of aromatic spirits of ammonia in ½ glass of water.

(b) Give salt and water (1 teaspoonful to a pint of water)— small amount frequently.

4. If unconscious:

(a) Stimulant — Aromatic spirits of ammonia on gauze or cloth held under nose.

(b) Call physician. (——)

HEAT STROKE OR SUNSTROKE:

1. Lay patient in cool room.

2. Elevate head.

3. Cold applications to head and body.

4. Rub limbs toward the heart.

5. Give no stimulants. Call physician at once.

HEAT CRAMPS: Apply heat and treat as for heat exhaustion.

SKIN IRRITATIONS: Any form of skin rash or irritation should be referred to the physician. Watch skin irritation cases to see if they are coming from a particular department. A protective cream, gloves or other protective clothing, or a change of procedure may be indicated. Most important is to see that enough washing facilities and mild soap are provided and that they are used.

ABDOMINAL PAIN: Refer to physician. NEVER GIVE A LAXATIVE.

BLISTERS: Apply antiseptic powder and cover with sterile dressing. Refer to physician. (——)

BOILS: DO NOT SQUEEZE. Refer to physician. (——)

CHOKING: Dislodge the obstructing material by striking firmly between the shoulder blades while the person is bent well over. If the object can be seen in the back of the throat and the person is in very acute distress from obstruction to breathing, attempt to remove it gently with your fingers. If this is not successful, rush the person to the physician.

EPILEPTIC SEIZURE: Place cloth-covered tongue depressor or clean wadded cloth between back teeth of patient. Put a pillow under the head. Gently restrain strong movements enough to prevent injury. Allow the person to rest afterwards.

FAINTING: Lay patient down, head lowered or at body level.

(a) If unconscious, crush ammonia ampule in gauze and hold near patient's nose.

(b) If conscious, give aromatic spirits of ammonia by mouth as directed. (——)

FEVER: When the temperature is one degree over the normal temperature (98.6°) the patient should be referred to the physician. (——)

HEART ATTACK: Place patient in a reclining position. Keep him quiet. Maintain warmth. If he carries "heart attack" medicine with instructions, help him take it. Call the physician. If the person is to be moved, caution him against trying to assist in the effort. His exertion may be costly.

HEADACHE: Take temperature. If normal, give an analgesic as ordered. A case requiring repeated dosage should consult the physician. (——)

[NOTE—If the following are also present—dizziness, nausea, fever, vomiting, stiff neck, injury, history of recurrence—then refer to the physician.]

HERNIA: Refer to a physician. If occurrence is very recent or has just happened, send or arrange transportation to the doctor at once.

MENSTRUAL DISORDER: Bed rest, heat to lower back and analgesic as ordered by physician. (——)

NOSEBLEED: Sit patient erect with head bent back a little. Cold packs to nose. If bleeding continues, grip the nostrils near the bone of the nose, press them together and hold 4-5 minutes.

Advise patient not to blow nose for an hour after bleeding stops. If it has not stopped, a doctor is necessary. (——)

SORE THROAT: Give gargle_____ Don't "paint" the throat. If persistent or severe, refer to a physician.

Space

SUITABLE space should be provided for carrying on efficient work. There should be a chair, small table, suitable washing facilities such as warm running water, soap and towels, and a good light. Where the plant is small and special space can not be alloted, place the kit so that it will be quickly accessible and easily reached—on a post or shelf near running water, a source of light and a stool or chair.

The kit itself should be a dust-proof wooden or metal box and should be kept clean and replenished at all times. All bottles should be clearly labeled. When the first-aider is being used as part of a medical staff, care must be exercised to use only those medicines and instruments which have been authorized for his use.

References

American Red Cross First Aid Textbook.
First Aid—Cole & Puestow.
Suggested Standing Orders for Nurses in Industry—Council on Industrial Health, American Medical Association.

Supplies

(Refer to Standard Requirements for Your State)

Tourniquet
Liquid Antiseptic
Powdered Antiseptic
Alcohol
Tincture Green Soap
Eye Solution
Soda Bicarbonate
Epsom Salts
Aspirin (or similar Analgesic)
Aromatic Spirits of Ammonia—Liquid and Ampule
Sterile Gauze Squares (3 in. x 3 in.)
Bandages—Assorted Sizes
Band-Aids
Adhesive—Assorted Sizes
Cotton
Applicators
Wooden Tongue Depressor
Safety Pins
Triangular Bandages
Scissors; Forceps
Thermometer
Ice Cap
Hot Water Bottle
Splints
Teaspoon
Medicine Glass
Paper Cups
Kleenex
Stretcher
Blankets

Industrial Hygiene Foundation

INDUSTRIAL Hygiene Foundation will hold its Ninth Annual Meeting at Mellon Institute, Pittsburgh, the Foundation's headquarters, on November 15 and 16, 1944. More than 260 of the nation's leading industrial concerns, all producing for war, are affiliated with the Foundation and will be represented at the sessions. Others are admitted by invitation. The program, geared for management, will consider sickness in industry and problems connected with sick absenteeism which call for postwar solutions. The panel on "Putting the Disabled Veteran Back to Work," which the Foundation pioneered at its 1943 meeting, will be continued and will report on helpful experiences companies are now gaining in fitting the returning soldier to the right job.

MARYLAND State Department of Health and Baltimore City Health Department recently amended their occupational disease regulation governing limits for toxic materials. The change provides that exposures to dusts, fumes, mists, vapors, gases or any materials that may effect health shall be kept below certain stipulated limits.

The Local Use of the Sulfonamides

—A Report of 846 Cases—

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ACCORDING to the latest report of the National Safety Council[1] there were approximately 1,750,000 non-fatal injuries in 1942—150,000 more than in 1941. About 70,000 resulted in some permanent disability. An estimated 270,000,000 man-days were lost because of occupational injuries.

Of particular interest to the industrial physician is that part of the report describing infections. The National Safety Council figures show that one out of five compensated hand or finger injuries involves infection. Foot and toe injuries become infected in one in 20 cases, while arm and leg injuries display signs of infection in one case in 16. The Council estimates that the national compensation bill for infected injuries might well run into $10,000,000 a year.

It is very important then, that the industrial physician make a real effort to reduce the incidence of infection following injury on the job. Our experience indicates that the local application of a combination of sulfanilamide and sulfathiazole in an oil-in-water emulsion base, with a wetting agent, is a most useful product for reducing the incidence and severity of infection following injury.

How Do the Sulfonamides Act?

IT IS AGREED by most investigators that the sulfonamide compounds exert a bacteriostatic rather than a bactericidal effect. The bacteriostasis produced by the sulfonamide compounds is in the form of an inhibition of the growth of the bacteria which results in a suppression of their invasive power, and, hence, allows the defense mechanism of the host to accomplish its function.

The exact manner in which these compounds exert this effect is not known, although numerous theories, many plausible enough but unsubstantiated by fact, have been advanced to explain the phenomenon.

The more popular hypotheses are the peptone theory, the peroxide-catalase theory, the para-aminobenzoic acid theory, the oxidation theory, and the enzyme mosaic receptor theory.

Briefly, the *peptone theory* which was first proposed by Lockwood[2] in 1938, assumed that the non-proteolytic bacteria literally "die by starvation" unless predigested proteins, such as peptone are supplied to them. Lockwood has shown that the presence of small amounts of peptone will diminish significantly the bacteriostatic effect of sulfanilamide on hemolytic streptococci in human serum. By way of explanation, he pointed out that the sulfanilamide combines in some way with the free amino-nitrogen of protein degradation products, and thus renders them unsuitable for bacterial nutritional requirements.

This observation, while not wholly substantiated, was significant because it focused interest on the fact that sulfonamide compounds are only slightly effective against bacteria in areas with tissue necrosis and purulent exudate. Hence, for better effective action of these drugs, local collections of pus and exudate should be removed.

The *peroxide-catalase theory*, described by Mellon et al.,[3] assumes that the sulfonamide drugs produce a hydroxylamine derivative which is enzyme-poisoning in its effect. The enzyme catalase functions normally to destroy the hydrogen peroxide that is liberated by certain bacteria during their respiratory processes.

The failure of catalase to neutralize this liberated peroxide results in the accumulation of the peroxide, and it in turn tends to render the organism more vulnerable to the anti-bacterial defense mechanisms of the host which eventually destroy the invader.

The more recent *para-aminobenzoic acid theory*, reported by Stamp,[4] holds that the sulfonamide action is of a competitive inhibition, due to a structural relationship which exists between the sulfonamides and para-aminobenzoic acid. He explains that the organisms accept the toxic sulfonamide instead of its necessary growth factor para-aminobenzoic acid. On the other hand, if sufficient para-aminobenzoic acid is present, the sulfonamide is displaced and the growth of the micro-organisms accelerated.

As a note of caution to those physicians who use the procaine anesthetics, it is well to remember that, practically speaking, these anesthetics are derived from the para-aminobenzoic acid series and thus can be expected to inhibit the activity of the sulfonamides.

The *oxidation theory*, first announced by Mayer[5] in 1937, proposes that sulfanilamide and related compounds, are oxidized in the body to a more active derivative or derivatives. They in turn are possessed of a high oxidizing intensity which damage the reducing systems of both bacterial and human cells. This would explain to some extent, the toxic effects of the drug on the human organism, which fortunately can withstand the injurious effect better than the bacterial cells. According to Fox,[6] the lag period which exists between the administration of the drug and the appearance of bacteriostatic action is due to the time required for the oxidation of the sulfonamide to take place.

The *enzyme mosaic theory*[7] considers the enzymes which are necessary for bacterial growth to be composed of reactive or receptive groups. Some of these reactive groups have an affinity for the aminophenyl radical and others for the amido linkage of the sulfonamide compound. If such linkage takes place, the enzyme is considered to be denatured and to suffer a decrease of its catalytic activity. The actual identity of the enzyme or enzymes affected is not settled, but, of course, loss of their necessary activity results in an attenuation of the growth rate of the bacteria, and a chance for the defensive mechanisms of the host to overcome the invader.

Schnitker[8] sums up the mode of action of the sulfonamides as follows: "They are specific drugs in their action, having a powerful effect on some bacteria and being without effect on others . . . . Their action is essentially bacteriostatic, and the natural defense mechanisms of the body have to complete the destruction of bacteria. In other words, the sulfonamides inhibit the growth of organisms and prevent overwhelming intoxication, until immunity can be mobilized and finally bring about recovery."

The Local Use of the Sulfonamides

THE local use of the sulfonamide drugs is now standard procedure in many industrial clinics. Experimental and clinical evidence has demonstrated the increased effectiveness of the sulfonamides when ap-

This study was made possible by a grant from The E. L. Patch Co., Boston.

plied directly to the wound or skin lesion. It has been shown, by Hawking,[9] Richards[10] and others that such local therapy provides a higher concentration in the tissues than can be obtained by oral administration, and thus it can be expected to combat infection more efficiently. One outstanding difficulty with the usual sulfonamide preparations in powdered form, has been the tendency towards "caking," causing them to act sometimes as a foreign body in the wound. This diminishes the effective utilization of the sulfonamide, tends to delay wound healing, and causes unnecessary discomfort for the patient. For the series of cases herein described, a cream* containing 3.75% sulfanilamide and 1.25% sulfathiazole in an oil-in-water emulsion base was used.

The choice of a mixture of sulfanilamide and sulfathiazole was predicated on the view that a sulfonamide product for local application would more frequently be called upon to combat a mixed infection. With sulfanilamide more soluble than sulfathiazole and less likely to cause a foreign body reaction, the proportion of sulfanilamide to sulfathiazole was set at three to one. Recently it was noted[11] that, in a memorandum entitled "The Medical Use of Sulfonamides" issued by the British Medical Research Council, the use of a mixture of the same two sulfonamides in precisely the same ratio—three to one—is advocated for treating war wounds. The advantages of both sulfonamides are thereby obtained without the disadvantages of either.

Miller[12] treated 115 cases of various dermatoses with 5 to 50% sulfanilamide, sulfathiazole, sulfadiazine and sodium sulfathiazole ointments. He stated that a 5% sulfonamide ointment was found to be just as effective as higher concentrations and less productive of reactions. Winer and Strakosch, and Pillsbury, *et al.*,[13] have shown that it is unnecessary to have the sulfonamide concentration in a product for external use exceed 5% to obtain a maximum bacteriostatic effect.

The Choice of a Sulfonamide Vehicle

ABOUT as important as the proper selection of sulfonamides to use externally is the proper choice of a vehicle to carry the drugs. On this may well depend the success or failure of local sulfonamide therapy in any given condition. That an oil-in-water emulsion of the type used in these studies is an appropriate vehicle for the external application of sulfonamides has been substantiated not only by our own very favorable clinical results, but also by the reports of other investigators.

Although simple and convenient to use, ointment bases of the greasy type present several disadvantages which are becoming increasingly evident. It is difficult to bring about an adequate and uniform dispersion of insoluble drugs in bases of this type. They don't mix with water or the aqueous wound secretions. Their greasiness and stickiness are often objectionable to the patient. Their removal is usually difficult and a frequent cause of pain. The particles of the incorporated drugs, surrounded by grease, do not get into direct contact with the cutaneous lesion or the wound fluid, and therefore the maximum effect cannot be expected.

Aqueous vehicles thickened with the aid of materials such as tragacanth, pectin, bentonite, etc., may encourage intimate contact between the drug and the infected area, but, as Pillsbury[14] and his co-workers bring out, these bases show a tendency to dry and flake off quickly. Lotions, they feel, have a limited usefulness, and water-in-oil emulsions may not be expected to show any superiority over all-grease bases, especially if the active ingredient is contained in the external oil phase. They advocate the use of an oil-in-water emulsion type base in which the sulfonamide is suspended or dissolved in the external aqueous phase. Such a base, in their opinion, is superior also to a vanishing cream type stearate base.

The advantages of an oil-in-water emulsion base over other bases were emphasized recently by Cole[15] in an article reviewing the status of local sulfonamide therapy. He points out that greasy bases are unsatisfactory for applying sulfonamides locally. A grease will seal off the area if it does not mix with serum and it may coat over the underlying infection and furnish an anaerobic pocket in which the infection may thrive. Moreover, bacteria covered with a film of grease will not be so easily reached by the medicament. Oil-in-water emulsion bases, his survey indicates, are apparently the best bases for applying any of the sulfonamides. Waud and Ramsay,[16] in investigating the diffusion of sulfonamides out of certain bases, came to the conclusion that an oil-in-water type of emulsion, in which the external or continuous phase is water, would be required in order that the drug would be continuously fed into the wound. They observed that the water-containing vehicles such as solutions of polyvinyl alcohol, acacia, and tragacanth, and oil-in-water emulsions, all show a free delivery of the sulfonamide, while the simple fatty bases show very little or no delivery of sulfonamide.

Ackman and Wilson,[17, 18] Gurd[19] and his group, and later on Fleet and Ackman,[20] working at the Montreal General Hospital reported very favorable results in the clinical use of an oil-in-water emulsion containing 5% sulfathiazole, 64% mineral oil, 5% white beeswax, 24% distilled water and 2% triethanolamine as the emulsifying agent. With the aid of this emulsion they were able to make effective use of the principle of "curtain drainage" in wounds and abscess cavities. They found that when gauze packing previously impregnated with the sulfonamide emulsion is removed, it comes away easily and with relatively little discomfort owing to its softness.

Like the product used by Ackman and Wilson, the sulfonamide cream employed in the cases reported herewith has a high mineral oil content. Mineral oil is well suited for this kind of an emulsion because of its neutral character, its chemical inertness and its resistance to change on exposure to air. Owing both to the high oil content and the high degree of emulsification, the product has a soft, creamy texture which makes it easy to apply. Dressings with it do not tend to adhere to the wound, and therefore can be easily changed as frequently as necessary without causing the patient any discomfort. The sulfonamides are present in the external or water phase, probably in solution to a slight extent, but chiefly in suspension. Instead of being coated with an impervious film of oil or grease which might interfere with their action, they are held in fine suspension in an aqueous mixture, but oil in emulsified form is present to prevent drying and encourage drainage.

A wetting agent incorporated in the water phase of the emulsion provides further assurance that the sulfonamides will be readily and quickly made available in an effective concentration at the site of the infection. Wetting agents are surface-active materials which, by lowering interfacial tension between liquids and solids, increase dispersion, spreading action and penetration. In a product for external use they can aid in the dispersion of the active ingredient, and also

*Thiasulfamix, Patch.

help bring it into intimate contact with the wound or lesion. Bellows and Gutmann[21] recently showed in experiments on rabbits that wetting agents increase the penetration of sulfonamides through the cornea. They found, too, that when the wetting agents were used in the recommended low concentrations, they produced no obvious untoward effects on the eyeballs of rabbits.

Clinical Experience

RECENTLY there have appeared in the literature a number of papers pointing out the possible reactions following the local application of the sulfonamides. One of the reasons for preparing this report was to describe our results on a large number of unselected patients. Out of the 846 cases on which we used the sulfonamide cream, only four showed any signs of sensitivity. They were so slight that some investigators might have continued on with the treatment, but we felt that in order to be objective, we should discontinue the local application of the sulfonamides whenever there was a question.

Without a doubt the coming of the sulfonamides for local use has led to a certain amount of abuse. There can be no substitute for sound surgical procedure, neither can we expect the sulfonamides to do our job for us. Caution must be used at all times when applying these valuable chemotherapeutic agents. A good general rule to follow is to apply the sulfonamides locally for only five to seven days. If it is necessary to continue the treatment longer, the physician should be on the lookout for the occurrence of any local reaction or systemic symptoms such as leucopenia, hematuria, oliguria, anuria, conjunctival injection, morbilliform rash, drug fever, dizziness, headache, mental confusion, peripheral neuritis, nausea, vomiting or hemolytic anemia. If any of these signs or symptoms should occur, the sulfonamide should be thoroughly removed from the area by flushing and cleansing. In patients who have a history of allergic manifestations (such as eczema, hay-fever, urticaria, angioneurotic edema, etc.) and in those who have had previous sulfonamide therapy, extra caution should be used by the attending physician when topical sulfonamide therapy is used.[15, 22]

It is also advisable to remember not to administer the sulfonamides orally when they are being used locally, unless facilities are available to do sulfonamide blood levels, urine examinations and daily blood counts.

Our experience has indicated that if the best results are to be obtained following local sulfonamide therapy, it is necessary to cleanse the surface of the wound, removing, if possible, all necrotic material, exudate and crusts before application of the sulfonamide cream. In the presence of para-aminobenzoic acid and allied peptone products which are derived from bacteria and pus cells, the sulfonamides tend to be inactivated, thus the reason for gentle, careful debridement.

Results of Treatment

LACERATIONS—178 cases.

The majority of the lacerations were under 24 hours old. Those wounds which were contaminated, but not infected, were carefully debrided to remove dirt, grease, and other foreign matter. The areas were then closed with sutures, and covered by a film of the sulfonamide cream protected by a sterile gauze sponge and bandage dressing. Those lacerations which were infected, when first seen, were likewise debrided, gently cleansed, and then packed with a sulfonamide impregnated dressing. Most patients reported back in 48 hours unless the wound was large, in which case they returned in 24 hours. When the dressings were removed the gauze came away from the affected surfaces without causing pain or bleeding. All of the sutured wounds healed per primam with no complications, such as cellulitis, lymphangitis, or edema. The infected lacerations progressed uneventfully, although the healing time was naturally prolonged.

ABRASIONS—151 cases.

The problem presented by an abrasion is somewhat different from that of a laceration. In our series of abrasions there was a loss of at least partial thickness of one square inch of skin to several square inches. The surgical technique in the abrasions was much the same as in the lacerations. The wounds were cleaned to remove foreign matter. The sulfonamide cream was spread on sterile gauze and placed directly on the abrasion. Dressings were changed every second day until new epithelium had covered the denuded surfaces. The dressings were comfortable even on moving parts such as the knees and elbows. In two cases an increased redness, a slight maculo-papular rash and swelling were noted after one week's application of the sulfonamide cream. After the local sulfonamide therapy was discontinued, the reactions subsided. One of these patients had had asthma. Neither had ever had sulfonamide therapy previously.

AVULSED WOUNDS—16 cases.

While an abrasion may be called a superficial avulsion, the term avulsion in this series is limited to those cases where at least full thickness skin was lost. Sometimes, of course, subcutaneous tissues were also involved. Most of these wounds were produced by broken glass, machinery, and severe friction burns. Of particular interest in these cases was to note whether the sulfonamides would keep the wound clean until healing was complete and whether the subcutaneous tissues and epithelium built up slower when in contact with the cream. In this series the wounds were also cleaned and hemostasis obtained. The cream was then applied directly to the affected surfaces. All of the wounds were seen within eight hours of inception. The areas healed from below upward. There was no impediment to the development of granulation tissue, and epithelium spread at normal speed. No signs of infection were noted. The gauze did not adhere to the new tissues. There were no complications.

MINOR BURNS—63 cases.

Minor burns present two problems to be solved by the local agent. Infection must be kept down and healing should not be impaired. The burns in this series were all minor burns, none of them involving more than 10% of the body area. All of the patients were ambulatory and wished to remain so. The sulfonamide cream was applied directly on a gauze pad which was then placed on the wound. In some cases sterile gauze squares were dipped into wide-mouthed pound jars of the cream before being applied to the wound. A light gauze bandage was used to hold the pads in place. Dressings were changed every second day. The gauze did not adhere to the affected surfaces, and there was no evidence of delayed wound healing. One patient showed a local increase in redness and edema. This disappeared when the sulfonamide cream was omitted. He had no allergic history, nor had he ever had the sulfonamides before, either locally or orally.

Although the series was small, enough clinical evidence was obtained to indicate that the local use of the sulfonamides in an oil-in-water emulsion base constitutes an effective and easy form of treatment. It is felt that the concentration of the sulfonamides in the burned area gave the tissues an immunity to in-

vading organisms, without destroying the spread of epithelium. The patients were comfortable. Dressing changes were not painful. The one case of apparent sensitivity is not regarded by us as a reason to stop applying the sulfonamides locally, but rather an indication that they should be used with caution.

INFECTIONS OF THE VAGINA AND CERVIX—19 cases.

The vagina and cervix are two areas where infection can remain chronic over a prolonged period of time with an apparent lack of interest or ability on the part of the body to do anything about. Certain types of infection are specific such as trichomonas vaginalis vaginitis. In other cases such as non-specific erosions of the cervix, the infection begins without apparent cause or dates back to childbirth. These infections are annoying to the patient, particularly because of the associated leukorrhea. At times, the annoyance is more pronounced when it is associated with burning and irritation on voiding. Frequently an ascending infection brings about a mild form of cystitis.

In our series of cases a specific technique was used for both vaginitis and endocervicitis. Through a speculum the vagina was thoroughly washed with green soap and water and dried. A tampon was then covered with sulfonamide cream and applied through the speculum. This was allowed to remain in for 24 hours, following which a 48-hour period was given the patient to douche daily. After this another tampon was applied, and the same schedule followed. In this series of patients the recurrence of infection was not as high as seen following the classic treatment. One advantage noticed by all the patients was that there was no odor to the tampon when it was removed.

Ackman and Wilson[17] emphasize that the vagina should be free of alcohol before it is packed with sulfathiazole. Since some physicians use a dilute solution of alcohol to cleanse the vagina before treatment, it is well to remember to thoroughly dry the area before packing. The chemical reaction on combining these two liberates what is probably an aniline, which causes a local necrosis. Ackman and Wilson observed this in one case when the damage from necrosis was followed by a local cellulitis which was particularly refractory to treatment.

FURUNCLES AND CARBUNCLES—73 cases.

Furuncles and carbuncles cannot be helped locally, except by hot compresses, until they come to a head and begin to drain. At this point they become open lesions, badly infected, containing necrotic tissue. The body usually builds up a pyogenic membrane in an effort to wall the infection to prevent invasion and to cause it to slough outward. Once the slough begins to separate, a raw surface is exposed that needs local treatment. In our series of cases it was found that daily dressings with the sulfonamide cream helped to prevent a surface spread of the infection which frequently results in more boils and carbuncles.

IMPETIGO—81 cases.

This condition occurs on exposed skin surfaces (face, neck and extremities), and spreads rapidly from one area to another, and from one person to another. Caused by staphylococci, streptococci, or both, impetigo is characterized by honey-yellow crusts which adhere to the underlying skin. When these crusts are removed, serum exudes from the skin. The technique in treating impetigo was to wash the surface with soap and water to remove scabs and crusts. A generous thickness of the cream was placed on the gauze and applied directly to the area unless it were on the face in which case no dressing was used. The patient was instructed to change the dressing morning and night. A scrub-up was advised before each new application of the cream to remove the scabs. The cream base kept the crust soft so that removal was easy. The average case of impetigo responded to treatment in four days. There were no allergic manifestations noted.

INFECTED LEG ULCERS—100 cases.

The etiologic factors behind the occurrence of leg ulcers must be thoroughly understood before treatment. Diseases of the peripheral vascular system—syphilis, diabetes, anemia, etc.—may play a part in the occurrence of the ulcer. Any local therapy which does not take into account the presence of any of these diseases may well fail. However, it is almost always desirable and necessary to treat the local infection as well as the generalized condition.

The sulfonamide cream was used in 100 infected ulcers of the lower extremities which had not responded to conventional therapy. Dressings were changed every day for from five to 32 days. Thirty patients failed to respond. The other 70 showed improvement but not complete disappearance of infection. All these patients had some circulatory disturbance of the legs (poor arterial supply, venous congestion from varicose veins, or lymphedema). All were difficult cases inasmuch as the surrounding skin and subcutaneous tissues were edematous, red and tender. In one patient who had hay-fever a generalized body rash and increased pain locally at the treatment site occurred after 14 days of local sulfonamide therapy. All untoward manifestations disappeared in three days after changing to boric acid ointment.

It is extremely difficult to evaluate the results of any local therapy on infected leg ulcers. Nutrition, age, occupation, and circulatory status all play important parts in the success or failure of treatment. Once the systemic factors have been checked, consideration can then be given to local therapy. Careful débridement and gentle cleansing are essential if local treatment is to have a chance. If infection is present, the use of a sulfonamide cream is indicated. In some instances, after the infectious stage, a 70% cod liver oil ointment* was found very useful in promoting healing.

EPIDERMOPHYTOSIS WITH SECONDARY INFECTION—69 cases.

In all the cases in this series there was some secondary infection. The secondary invaders were usually streptococci and staphylococci. They gained access through the crevices produced by the fungus and excoriations made by scratching. In all the cases there was some cellulitis. Two of the cases had marked lymphangitis and lymphadenitis. Three of the cases were infected over wide-spread areas.

When the epidermophytosis, complicated by secondary infection, was confined to the feet the patient was advised to wash the areas with warm water and soap and then soak them in hot water and epsom salts for 20 minutes. He was next instructed to cover the infected areas with the sulfonamide cream and to wear a clean pair of white cotton socks to bed. The cream that remained on the feet the following day was not washed off until night time when a new application was made. When the lesion covered large areas of the body, the patient was instructed to keep a coating of the cream in constant contact with the infected parts.

Most of the feet cases were free from infections within 10 days. Two of the three cases showing widespread infection were hospitalized because of extreme itching and discomfort. One remained in the hospital for two weeks and one for 10 days. The other patient was cared for at home by her daughter who was a

*Gadoment, Patch.

trained nurse. In the three large surface involvements there was no untoward reaction following local sulfonamide therapy.

INFECTED ECZEMAS—37 cases.

The term eczema is a broad one and is usually modified by a descriptive word indicating the etiology. Once the cause is found and removed, most cases of eczema differ only in the skin area involved and in certain cases in the depth. The problems presented by infected eczemas are (a) loss of continuity of skin; and (b) secondary infection.

The tissues involved in the areas of eczema are apparently devitalized and have lost much of their local immunity. Healing is slow and secondary infection is prone to linger.

In this series of cases the areas involved varied in size from a few square inches to over 50% of the body surface. Most of the cases were extremely slow to heal, but not more so than under other forms of treatment. Infection was adequately combatted and even though indolent, the areas remained clean. The itching that usually accompanies eczema was alleviated quite rapidly and the dressings were comfortable. In the cases in which a large enough area was involved to indicate hospitalization, patients were placed nude under a cradle and a thin film of sulfonamide cream applied. It was found necessary to apply the cream more frequently where the areas were weeping in order to keep the cream in contact with the raw surfaces. Two cases had over 50% of the body involved. These undoubtedly developed a high local concentration, but the blood level never rose above 3 milligrams per cent. There were no untoward symptoms that could be attributed to the sulfonamides.

PILONIDAL SINUS (POSTOPERATIVE)—59 cases.

Pilonidal sinus, or "Jeep disease" as it is called in the Army, is a congenital malformation found in the skin and subcutaneous tissues of the coccygeal area. This condition occurs more frequently in the male than in the female. It usually lies dormant until puberty when, due to the formation of hair and increased skin excretions, the sinus fills up and provides an ideal media for infection. In such types of abscess cavities as the pilonidal sinus the use of the sulfonamide cream has been of inestimable value. Following excision by the electrocautery of the infected pilonidal sinus tract, there is considerable purulent drainage from the cavity. The odor is usually quite unpleasant. The use of the sulfonamide cream, packed in pilonidal cavities postoperatively, has markedly reduced both the incidence of purulent drainage and the offensive odor. We have observed that the grey, infected granulations rapidly become clean and healthy, the discharge lessens, and healing seems to take place more rapidly. After the infection has been controlled, it has been our practice to discontinue the use of the sulfonamide cream, and apply a 70% cod liver oil ointment to promote granulation tissue and encourage the spread of epithelium.

Conclusions and Summary

INFECTION following injury is a real problem in industry. The industrial physician has come to view the local application of the sulfonamides as a forward step in the direction of cutting down the disabling and time-consuming effects of infection. In our series of 846 unselected cases we have found that local sulfonamide therapy, when used with caution, is a valuable addition to our armamentarium. It is important to emphasize, however, that for best results careful débridement and gentle cleansing must be done. The sulfonamides cannot function effectively in the presence of para-aminobenzoic acid or breakdown products of pus, exudate and bacteria.

A combination of 3.75% sulfanilamide and 1.25% sulfathiazole suspended in a special oil-in-water emulsion base with a wetting agent, has provided us with the most effective local sulfonamide product we have used to date.

In so far as possible, the sulfonamides should be administered locally for a period of five to seven days—this procedure will tend to cut down sensitivity reactions. If it is necessary, however, to continue treatment longer, care should be taken to note any signs or symptoms usually associated with sulfonamide reactions. Out of the 846 cases in which this precaution was observed, only four showed signs of possible sulfonamide reaction.

Until some other local agent is developed which shows better clinical performance, we will continue to use a combination of sulfanilamide and sulfathiazole to combat infection.

[THE AUTHORS wish to thank DRS. R. S. MYERS and R. W. HOWARD and MR. WILLIAM T. DOYLE for their valuable assistance in making this study possible.]

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Industrial Health and Medical Services

—In Oklahoma City—

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HEALTH and medical services in varying aspects are practiced in practically every business concern and institution in the country that employs labor.

[ACKNOWLEDGEMENTS: It is a pleasure to make public acknowledgement of the cooperation of the plant managers of the employing agencies of Oklahoma City and other individuals whose interest has made this general survey possible. The officials, and in some cases the plant physicians, produced information which has been of considerable value in preparing this compilation. MR. R. H. GRAHAM and MR. PAUL H. FESLER, Executive Secretaries of the State Medical Association, gave advice and counsel at the beginning of and during the survey. MISS MARGARET FINLEY, Statistician of the State Department of Health, rendered valuable assistance in the preparation of tables and the analysis data.]

Much of this work originated with the Safety First Movement. Problems resulting from injuries and subsequent compensation brought about an urgent demand for information and control methods by all groups concerned. Management and insurance carriers were interested primarily in lowering costs and overhead, as well as lost time from work. Subsequently, it became apparent to management and the workers alike that these steps were of great value in preserving the physical well-being and employability of the workers themselves. It was demonstrated that humanitarian interests could properly and profitably be incorporated in an employment policy. At this time the safety movement is universally accepted and is in a rather high state of efficiency throughout the nation.

As the country became more industrialized, especially during the period of World War I, attention was directed toward the improvement of the general health of the employee. Special attention was given to occupational hazards and illnesses. When it became apparent that much good was accruing from this type of prevention, further improvements were adopted. Physicians were retained to conduct physical examinations of job applicants, dispensaries were opened, nurses were employed to assist in emergency work, record keeping was instituted, and group insurance and hospital benefits put into force. From this point, numerous additional advances have been made.

It would seem appropriate to point out that all wage-earning workers should be considered industrial workers. They are to be found in a great variety of industries. Plants and institutions employing labor may well be assigned to one of three major groups, namely: manufacturing, sales, or service agencies. Examples of these are to be found in milling, refining, contracting or printing; retail, wholesale or commission houses; and hotels, utilities, schools and transportation agencies. In this report about 30 different types are to be considered.

Surveys have been concluded in 125 institutions of Oklahoma City. In the majority of cases, the information was gathered from top management. Where possible, it was secured in more detail through the staff of the existing medical department. This work was instituted with the approval of the Commissioner of the State Health Department and his supervisors. It was believed that a study of medical and health conditions of a fairly large and representative group of employing agencies located in a compact section of Oklahoma would provide a cross section of information and data which would be useful to official and non-official agencies, management, labor, the medical profession, the nursing profession, and the public.

The following sections will contain an analysis and discussion of the findings in a general manner, with special attention being given to the services which are available according to types of industry and total plant employee population. In the latter classification, the personnel groups have been divided into three sections; those of 150 or less, which numbered 76 firms; 150 through 449, which numbered 35 firms; and those of 450 and above, with 14 firms.

The Plant Medical Staff and Assistants

APPROXIMATELY 290 physicians have been engaged in general or special practice within the environs of Oklahoma City. Fifty specified practitioners have been named as the medical consultant by the 125 institutions contacted in the study. In addition to these, numerous alternates and clinics have been designated by management as their medical counsel and agents. It would seem that one could safely estimate that 75, or 26%, of the physicians are engaged in some form of industrial health and medical practice in Oklahoma City. Nineteen were retained by more than one establishment. In addition to hospitals (service agencies), one manufacturing concern retained a full-time plant physician. Five service agencies and three manufacturing concerns employed a part-time physician. One hundred twelve firms designated a particular physician they relied on to handle their injury work or preventive medical care, or both, on an "on-call" basis.

Occasionally, the latter served in addition to full- or part-time physicians. Five service agencies employed a full-time registered nurse, and four manufacturing concerns employed one or more registered nurses. Two service organizations employed a part-time registered nurse. Written standing orders for nurses were a standard policy in only three concerns. Medical or technical assistants were used in one sales, three service, and one manufacturing concern. One service establishment retained a full-time dentist for preventive dental care, until relieved for military duty.

Industrial health service in small plants of this locality, as was the case in other areas, understandably has been somewhat slower in developing than have the health services of larger organizations. In most instances, medical services in the smaller industries in the past have consisted only of the care of injuries to employees while at work as required by the workmen's compensation laws. It has been thought that it was not an economically sound practice to engage full- or part-time medical and nursing personnel. It is interesting to note that in this area, where physicians or nurses have been employed on a scheduled or "on-call" basis for plant duty other than for injury work, the practice has been received very enthusiastically by all parties concerned.

Medical Department Services and Facilities

THE data furnished by the organizations herein being considered emphasizes that the major activities of the industrial physicians have been somewhat limited to conducting medical examinations. Pre-employment or placement examinations have been

TABLE I.
MEDICAL SERVICE BY TYPE OF INDUSTRY

Type of Industry	Number of Plants	Plant Physicians: Full-Time No.	Full-Time Per-cent	Part-Time No.	Part-Time Per-cent	On-Call No.	On-Call Per-cent	Medical Examinations: Pre-Employment No.	Pre-Employment Per-cent	Periodic No.	Periodic Per-cent	Re-Exam. No.	Re-Exam. Per-cent
Manufacturing	39	1	2.6	3	7.7	36	92.3	18	46.2	8	20.5	1	2.6
Sales	40	0	...	0	...	39	97.5	5	12.5	4	10.0	1	2.5
Service	46	2	4.3	5	10.9	37	80.4	25	54.3	9	19.6	3	6.5
Total	125	3	2.4	8	6.4	112	89.6	48	38.4	21	16.8	5	4.0

TABLE II.
MEDICAL SERVICE BY NUMBER OF EMPLOYEES

Number of Employees	Number of Plants	Plant Physicians: Full-Time No.	Full-Time Per-cent	Part-Time No.	Part-Time Per-cent	On-Call No.	On-Call Per-cent	Medical Examinations: Pre-Employment No.	Pre-Employment Per-cent	Periodic No.	Periodic Per-cent	Re-Exam. No.	Re-Exam. Per-cent
Less than 150	76	0	....	1	1.3	73	96.7	20	26.3	11	14.5	1	1.3
150-449	35	1	2.9	0	....	32	91.4	17	48.6	5	14.3	3	8.6
450 and over	14	2	14.3	7	50.0	7	50.0	11	78.6	5	35.7	1	7.1
Total	125	3	2.4	8	6.4	112	89.6	48	38.4	21	16.8	5	4.0

carried on among 38% of the total group. (See Tables I and II.) If one excludes the sales organizations, it is observed that 50% of the service and manufacturing organizations conducted this type of examination. Those groups having a total personnel of 50 to 150, followed the practice in 26% of the total. The per cent following this procedure increases with the size of the plant population to 78% in those with 450 or more employees. While a majority of those doing pre-employment physical examinations included every applicant, some companies limited the procedure to supervisory personnel, shop workers or to men. Periodic annual examinations were used in 17% of those companies having 50 or more workers. Those with 50 to 150 workers, examined them in 15% of the concerns. Those having 450 or more followed the practice in 35% of cases. Curiously enough, periodic check-ups in some establishments would be done on key people, and in other cases on outside men or shop workers. It was often remarked that the office or female workers were omitted from the established policy. A few of the examinations were conducted on the company premises, but in the main the workers were obliged to visit the private office of the designated physician. As far as could be learned, no employee was obliged to pay for any strictly medical examination. It was also learned that, in the case of periodic tests, the procedure was not usually mandatory. Where pre-employment examinations were done, they were nearly universally obligatory, although in some establishments having an extreme labor turnover, the workers would be allowed an exemption for perhaps two or three weeks until their status seemed to be fairly permanent. Re-examinations upon return to work following illnesses or other special check-ups were reported in only five organizations. The data in respect to them did not disclose any significant information in either type or size of concern.

Laboratory examinations such as urinalysis, blood count, or test for syphilis and gonorrhea received some attention in 40% of the 125 establishments. Blood tests for syphilis were acknowledged to be mandatory among workers in food manufacturing and food purveying concerns. Ten general manufacturing and five service agencies used blood tests for syphilis. It appears that blood testing as a company policy was influenced very largely by legal requirements, as observed in the records of the food handlers. There appeared to be some evidence that the food handlers were not always examined in all cases, owing in part to rapid turnover and negligence on the part of the management. Some concerns centered this activity on members of the negro race; others limited the practice to so-called outside men. Often the women were not tested at all. Urine tests were made in 22% of the entire group. Only seven organizations were either equipped with x-ray machines, or made it a part of their policy to examine the employees by this method. This type of service was predominantly a policy of the service agencies. These seven plants were distributed through the small, medium, and large personnel groups. Only one manufacturing plant reported the use of x-rays.

Seven company physicians conducted plant tours for the purpose of determining health hazards and to become familiar with the materials, by-products, and operational methods. Seven made observations and recommendations relative to environmental sanitary conditions.

Data pertaining to the use of partially handicapped workers were not tabulated, but it was learned that a number of small and medium-sized concerns had experimented with and used quite a number of this type of worker. In the great majority of cases, the reports were quite favorable as to their efficiency, interest, initiative, and productivity. Litigation by the handicapped was reported only once, and involved men not acceptable to the Selective Service.

Scant attention was given by the company physicians to matters of general health education for the workers. Most of this type of service was provided by commercial insurance companies in the form of posters and leaflets. Two medium-sized manufacturing concerns made showings of health subjects through motion pictures. Several of the manufacturing and larger service agencies employed a safety man or director, and a few safety committees existed. Safety and, occasionally, occupational disease, were the commonest subjects studied by these committees. During the winter season "cold" posters and admonitions were posted on the walls and passageways. In the warm season some of the heavy industries distributed suggestions relative to the use of salt in the treatment and prevention of heat exhaustion.

Safety Provisions

SAFETY work has been handled in three ways, namely, by having kits, kits and operators, and through the use of the plant dispensary in which the cases are treated by a nurse or physician. Those plants having a personnel of less than 150 used kits alone in 62% of the total number of firms. (See Tables III and IV.) Operators with first aid training were available in 24% of those plants with less than 150 employees, 31% of those with 150 to 450 employees, and 86% of those with more than 450 employees. Some of the large firms held weekly safety classes. During the winter a class was held at Central High School which was

TABLE III.
FIRST AID, HEALTH EDUCATION, AND PLANT RECORDS BY TYPE OF INDUSTRY

Type of Industry	Number of Plants	First Aid Facilities: Operator and Kit		First Aid Facilities: Kit Only		Plants with Health Education Activities		Plant Records: Absenteeism		Plant Records: Occupa. Diseases and Injuries		Plant Records: Non-Occupa. Diseases and Injuries		Plants Having Restaurant or Lunch Counter	
		No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent
Manufacturing	39	15	38.5	20	51.3	16	41.0	8	20.5	18	46.2	9	23.1	4	10.3
Sales	40	5	12.5	31	77.5	8	20.0	7	17.5	15	37.5	6	15.0	6	15.0
Service	46	21	45.7	18	39.1	13	28.3	13	28.3	18	39.1	11	23.9	19	41.3
Total	125	41	32.8	69	55.2	37	29.6	28	22.4	51	40.8	26	20.8	29	23.3

TABLE IV.
FIRST AID, HEALTH EDUCATION AND PLANT RECORDS BY NUMBER OF EMPLOYEES

Number of Employees	Number of Plants	First Aid Facilities: Operator and Kit		First Aid Facilities: Kit Only		Plants with Health Education Activities		Plant Records: Absenteeism		Plant Records: Occupa. Diseases and Injuries		Plant Records: Non-Occupa. Diseases and Injuries		Plants Having Restaurant or Lunch Counter	
		No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent
Less than 150	76	18	23.7	47	61.8	20	26.3	11	14.5	30	39.5	13	17.1	10	13.2
150-449	35	11	31.4	20	57.1	11	31.4	9	25.7	15	42.9	9	25.7	14	40.0
450-over	14	12	85.7	2	14.3	6	42.9	8	57.1	6	42.9	4	28.6	5	35.7
Total	125	41	32.8	69	55.2	37	29.6	28	22.4	51	40.8	26	20.8	29	23.3

TABLE V.
INSURANCE BY TYPE OF INDUSTRY

Type Industry	Number of Plants	Group Insurance		Hospital Benefits		Plants Paying Part of Employee Insurance and Hospital Benefits		Plants Using Commercial Compensation Insurance Carriers	
		No.	Per-cent	No.	Per-cent	Number	Percent	Number	Percent
Manufacturing	39	25	64.1	23	59.0	17	43.6	31	79.5
Sales	40	32	80.0	29	72.5	13	32.5	32	80.0
Service	46	25	54.3	28	60.9	20	43.5	21	45.7
Total	125	82	65.6	80	64.0	50	40.0	84	67.2

TABLE VI.
INSURANCE BY NUMBER OF EMPLOYEES

Number of Employees	Number of Plants	Group Insurance		Hospital Benefits		Plants Paying Part of Employee Insurance and Hospital Benefits		Plants Using Commercial Compensation Insurance Carriers	
		No.	Per-cent	No.	Per-cent	Number	Percent	Number	Percent
Less than 150	76	54	71.1	50	65.8	29	38.2	56	73.7
150-449	35	19	54.3	21	60.0	17	48.6	22	62.9
450 and over	14	9	64.3	9	64.3	4	28.6	6	42.9
Total	125	82	65.6	80	64.0	50	40.0	84	67.2

attended by approximately 20 persons, who represented major industries in the community.

Food Services

LUNCH room, dining room, or cafeteria facilities were available for the workers in one fourth of all those establishments with personnel of 50 or above. This type of facility was the exception rather than the rule in manufacturing plants. Sixty-five percent of the total were found in the service agencies. A great majority of the workers either brought their lunch or made use of outside eating places. (See Tables III and IV.)

Records

RECORDS pertaining to absenteeism were maintained in some form among 18% of the establishments having 50 to 449 workers. (See Tables III and IV.) Fifty-seven percent of those with 450 or more kept some form of absentee data. While every company probably used some sort of injury record, a separate injury and occupational disease summary was made in only 51 establishments. Non-occupational disability data was maintained in 26 concerns. In the matter of type of industry, there was little difference. Analysis of these records, according to cause of absence or type of occupations, was the exception rather than the rule. Thus, it would be improbable that very many employers would be able on relatively short notice to make any statement regarding their annual rates of illness or accident according to length of absence, cause, or working environment.

Employee Benefits

RETIREMENT and pensions were more commonly found in those companies having 450 or more employees. Only eight concerns in the lower brackets maintain any such benefits. Group insurance and hospital plans for the workers were found to be a fairly common practice. Based on type of industry, it was noted that group insurance was a company policy in 64% of manufacturing concerns, 80% in sales organizations, and 54% of the service agencies. Sixty-five percent of the total number of institutions in this group provided or allowed some form of group insurance; 64% presented data showing some form of hospitalization was made use of by the workers.

The cost of both group insurance and hospitalization has been shared by the management and the employees in 40% of the whole industry. Sixteen companies paid all of the insurance costs and part or all of the hospitalization.

In both the manufacturing and service classifications 43% of the concerns shared in the costs of these types of benefits, while 32% of the sales concerns paid part of the cost.

Insurance Carriers

COMMERCIAL carriers were retained to carry the compensation risks in 67% of the total list of institutions. Approximately one-third of the establishments covered their own risks. The latter practice was more commonly followed by the service agencies and the larger concerns.

Summary

AN ACTIVE and up to date preventive health and medical program for the workers in this area appeared to be somewhat the exception rather than the rule. The progress that has been made along this line must be credited to the interest and demands of management. Medical societies have given rather limited attention and study to matters of industrial medicine and industrial health. Pre-employment and laboratory examinations among approximately a third of the establishments comprised the major portion of the health activities that were in force. Retail and wholesale establishments were behind the other two classifications in examinations and trained operators for first aid, etc.

The size of the plant population appeared to have an influence on the employment of a full- or part-time physician, the practice of requiring pre-employment examinations, trained first aid workers, health education activities, and the keeping and studying of records pertaining to absenteeism, and non-occupational as well as occupational illnesses and injuries.

Recommendations

THE physicians of the community should take steps toward assuming leadership in matters of preventive and remedial industrial health and medical practice. Individually, the industrial physicians should render a competent professional service at a reasonable rate of remuneration, and, where possible, offer advice and counsel to management in the conduct of a well established health and medical program and department in the individual establishments.

Management should continue and enlarge in some cases the scope of the health and medical programs in their respective organizations. Medical counsel should be retained to act in an advisory as well as a strictly professional capacity. To stimulate and maintain interest many companies often bear expenses of journals and books, and visits by their company physicians to neighboring and out-of-town industrial clinics. Since the medical and laboratory examinations are basic in any health program, they should be made a part of the service to be rendered *each* person who may be a part of, or may join, the organization. To encourage and retain the cooperation of the employees, it would seem expedient to maintain medical records in strict confidence between the medical department and the individual. In selected cases, it would seem practical to study the matter of retaining a qualified registered industrial nurse to assist in the medical department. The personnel and medical departments

should cooperate in matters of mutual concern. More attention to matters of first aid, sanitation, housekeeping and workroom hazards is indicated. Sales agencies especially should increase their medical services and should take steps to provide better toilet and bathing facilities for the workers in their establishments where the rougher type of work is performed.

Employees should cooperate and work with management and the company medical staff toward making their particular plant a healthy and pleasant place to work. They should at regular intervals submit to medical and laboratory examinations and follow standard professional advice promptly. They should join in the health discussion groups, form good eating and hygiene habits, and practice health as well as safety first.

Third Post-Graduate Course

—In Industrial Medicine—

DR. JEAN A. CURRAN, President and Dean of the Long Island College of Medicine, Brooklyn, New York, announces the presentation by the College of its Third Post-Graduate Course in Industrial Medicine. This course will be given under the auspices of the Department of Preventive Medicine and Community Health during the three-week period October 16 to November 3, 1944, and will be conducted by more than 50 leading physicians in industrial practice, authorities in allied fields and members of the faculty of the College.

The main objective of the course is to provide physicians engaged in full-time or part-time industrial practice, as well as those who wish to enter this field, an opportunity to orientate themselves more fully to modern procedures in the rapidly developing specialty of industrial medicine. The two previous courses in this field, given by the College in the fall of 1942 and 1943, were presented as a wartime service to industry at a time when expanding production required increasing numbers of qualified physicians for industrial practice. The course this year will place particular emphasis upon postwar conditions and problems associated with the return of workers from military service. Although designed for graduate physicians, the course will be open to industrial executives, personnel workers, industrial nurses, hygienists, engineers and to others interested to industrial health.

The program of the course has been planned by the Industrial Medicine Advisory Committee of the College, of which DR. JOHN J. WITTMER, Medical and Personnel Director of the Consolidated Edison Company and an alumnus of the College, is chairman. Other members of the Committee are: DR. S. POTTER BARTLEY, Assistant Clinical Professor of Surgery, Long Island College of Medicine; DR. CURRAN; DR. THOMAS D. DUBLIN, Professor of Preventive Medicine and Community Health, Long Island College of Medicine; DR. LYDIA G. GIBERSON, Industrial Psychiatrist, Metropolitan Life Insurance Company; DR. IRVING GRAY, Chairman of the Subcommittee on Industrial Medicine, Kings County Medical Society; DR. MELVILLE H. MANSON, Medical Director, American Telephone and Telegraph Company; and DR. FREDERICK H. SHILLITO, Medical Director, Atlantic Division, Pan American Airways.

The presentation of the course will include afternoon and evening lectures and seminars at the College, supplemented by morning clinics and demonstrations arranged in cooperating hospitals and industrial medical departments. Segments of the course will be devoted to Medical Administration in Industry, Industrial Aspects of Internal Medicine, Industrial Surgery, Occupational Diseases, and Personal Relations in Industry. A unique feature of the course is the emphasis which will be given to the medical aspects of personnel problems. Lectures presented during the course will provide the basis for the Long Island College of Medicine Yearbook of Industrial Medicine.

Enrollment in the course will be limited to 60 full-time students and a tuition fee of $60 will be charged for the entire three-week course. A limited number of applicants particularly interested in specific phases of industrial medicine or with special qualifications will be accepted for admission on a part-time basis. A detailed schedule of lectures and seminars is being prepared by the College and will be available early in September. All inquiries concerning the course should be addressed to DR. THOMAS D. DUBLIN, Department of Preventive Medicine and Community Health, 248 Baltic Street, Brooklyn 2, New York.

Fractures in Industry

—Survey in a Shipyard—

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Long Beach, California

TRAUMATIC surgery aims to restore greatest function in the shortest time with the least income time-loss at a reasonable cost. This objective is paramount in wartime industry. Diligent attention to trauma gives satisfaction to the injured, maintains his effective future functional capacity, and minimizes compensation and permanent disability costs, as well as reduces malpractice litigation in this field.

Fractures in industry constitute an important group of disabilities. This report presents the distribution and frequency of fractures in a major shipbuilding industry and includes consideration of some practical points in management of the more common fractures.

Heavy work in steel shipbuilding creates serious traumatic hazards. The industry herein surveyed operates under close supervision of a highly trained safety engineering staff, which accounts for the low incidence of fractures of minor and major types.

This report gives the incidence, types and frequency of fractures in a major shipyard of modern design, assembling large merchant freighters and smaller warcraft, which employed a monthly average of 15,788 men through the nine-month period from October, 1942, to June, 1943.[1] The first aid hospital within the shipyard gave service to a monthly average of 4,912 new cases; 2,235 of these or 45.4% required attention to the eye for foreign bodies, superficial or penetrating, flash burns and eye infections including numerous cases of epidemic kerato-conjunctivitis prevalent in the period analyzed.

Of 15,788 employees who sustained 4,912 new injuries a month, over a period of nine months, 371 incurred fractures, which gives an incidence of fractures exclusive of eye cases of 1.5%. Three hundred eighty-six fractures occurred in 371 individuals; 211 were sufficiently simple to receive initial and subsequent care in the first aid hospital, whereas 160 sustained fractures requiring outside attention. Fifty-five per cent of the fractures, therefore, were suitable for treatment in the first aid hos-

pital; 45% were treated elsewhere.

The distal portions of the extremities are the sites of greatest fracture frequency. Fractures of the hand rate highest incidence, 37.8%; those of the feet second, 31.6%. In 146 cases of hand-carpal fractures, the phalanges were fractured in 125 instances, the metacarpals in 18 and the carpal bones in three; whereas other bones of the upper extremities constituted 8.2% of the fractures, or 32 cases. The radius was fractured in 13 instances, the ulna in 10, the humerus in four, the scapula in three, and the sternum and clavicle in one each.

Of all fractures, 31.6% involved the feet. In this group of 122 cases, 82 sustained fractures of the toes, 31 of the metatarsals, six of the tarsals, one of the astragalus, and two of the os calcis. Fractures of the lower extremity other than the feet, constituted 9.3% of all fractures, or 36 cases in which the fibula was fractured in 13 instances, the tibia in seven, semilunar cartilage torn in eight; the ankle fractured in four, and the patella in four cases. Fractures of the spinal column and pelvis occurred in 3.9%, or 15 cases, consisting of fracture of the transverse vertebral processes in four, spinous processes in one and the body of the vertebrae in two instances. Pelvic fractures numbered four, sacral two, and coccygeal two.

Fractures of the head and face occurred with the same frequency as those of the spinal column and pelvis, namely, 3.9%. Of 15 cases, there were six fractures of the nose, five fractures of the maxillae and zygoma, and four of the cranium proper. Ribs were fractured in 5.1% of cases. There were two dislocations, in both instances involving the shoulder joint.

A summary discloses fractures occurred in the upper and lower extremities combined in 86.9% of all cases, of which the hands were fractured in 37.8%, the remainder of the upper extremity in 8.2%. Lower extremities sustained fracturing in 40.9% of cases, with the feet showing an incidence of 31.6%, and the remainder of the lower extremity 9.3%.

Incidence of Fractures		
Average monthly employees	15,788	
Average monthly new injuries	4,912	
Average monthly eye cases	2,235 or 45.4%	
Total all fracture cases	371	
Total number fractures	386	
Total fractures treated at field hospital	211 or 55%	
Total fractures treated outside	160 or 45%	
Incidence of fractures (exclusive of eye cases	1.5%	

Types of Fractures		
Upper extremities		46%
Hands	37.8%	
Remainder upper extremities	8.2%	
Lower extremities		40.9%
Feet	31.6%	
Remainder lower extremities	9.3%	
Ribs		5.1%
Head		3.9%
Spine		3.9%

Individual Fractures		
Hands		146 or 37.8%
Phalanges	125	
Metacarpals	18	
Carpal	3	
Feet		122 or 31.6%
Toes	82	
Metatarsals	31	
Tarsal	6	
Astragalus	1	
Os calcis	2	
Upper extremities (exclusive of hands)		32 or 8.2%
Radius	13	
Ulna	10	
Humerus	4	
Scapula	3	
Sternum	1	
Clavicle	1	
Lower extremities (exclusive of feet)		36 or 9.3%
Fibula	13	
Tibia	7	
Semilunar cartilage	8	
Ankle	4	
Patella	4	
Spinal column and pelvis		15 or 3.9%
Vertebrae (transverse process 4, body 2, spinous process 1)	7	
Pelvis	4	
Sacrum	2	
Coccyx	2	
Head cases		15 or 3.9%
Skull	4	
Superior maxilla and zygoma	5	
Nose	6	
Fractured ribs		20 or 5.1%
Dislocations (shoulder)	2	

THESE statistics demonstrate the necessity for careful consideration in management of the more common and frequently more simple fractures. These if properly treated will result in little or no time loss, whereas, if improperly treated, they may result in a large degree of functional disability with high permanent disability ratings and ultimate permanent capacity loss to the individual and industry as a whole.

Therefore, careful attention must be directed to the care of these prevalent injuries. Fractures of the phalanges, which constituted 32% of all fractures, are frequently simple, but require meticulous management if ultimate efficient function is preserved. An attitude that fractures of the fingers and hands are minor fractures requiring only cursory attention may result in a poor type of treatment, which is a gross misconception of the importance of fractures that involve a principal functional unit in a workman, crippling one of his greatest assets. These fractures are simple or compound. In this industry, as a general principle, the simple fractures may be appropriately treated by immobilization in molded plaster casts, with fingers in a partially flexed position, the metacarpal-phalangeal joints flexed 45°, the proximal interphalangeal joints 90°, the distal interphalangeal joints 45°. This cast fixation is generally maintained three weeks, during which time it is often possible for these men to assume temporary lighter work. Compound fractures of the hand are of major significance and must be accorded appropriate treatment. These fractures demand that the cardinal principles in the treatment of compound fractures be followed—which necessitates thorough cleansing of the wound under appropriate anesthesia, done gently and thoroughly, may include instillation of an appropriate sulfa drug, followed by closure of the wound, appropriate reduction of the fracture, traction if required, and closed-cast fixation.[2] Compound fractures with loss of skin substance may require skin grafting. Reconstruction of the thumb, which constitutes the most important digit, demands particular attention.[3]

While fractures of the distal phalanges of the fingers are common, more than one-half of the

Fig. 1
Tendo-muscular displacement forces acting on fracture of proximal phalanx

fractures of the fingers are in the shaft of the proximal phalanx. These fractures commonly angulate forward, which displacement is corrected by flexion of the metacarpal-phalangeal joint to 45° with the proximal interphalangeal joint flexed at 90°. The accompanying illustration shows the well-known musculo-tendinous forces exerted which cause the characteristic deformity. (Fig. 1.) Flexed fingers of the hand normally do not lie parallel to the companion metacarpals, inasmuch as each finger in a flexed position points to the tubercle of the scaphoid bone of the wrist.[4] A common error in fixation of phalangeal fractures is made by fixation of the phalanx parallel to the forearm. This mistake is easily made in fractures of the phalanges, more particularly the proximal and middle, fractured transversely or obliquely; should rotational displacement occur, mal-position would not allow the digit to flex in company with its companion; rather, the digit would flex in an obtuse obstructive manner, reducing effective grasp of the hand to a high degree. Therefore, greatest attention should be given to fixation of the digit in a position pointing the tip of the finger toward the tubercle of the scaphoid bone. Removal of the cast after three weeks is followed by volitional exercises which do not include forceful passive stretching or manipulation. It has been pointed out that fractures of the middle phalanx may be treated by extension or flexion, de-

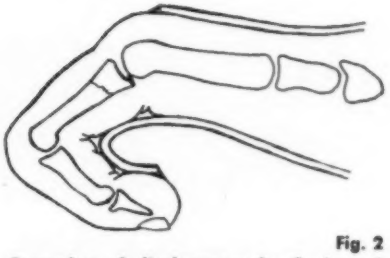


Fig. 2
Correction of displacement by flexion of metacarpal-phalangeal to 45°, proximal interphalangeal 90°, distal interphalangeal 45°

pending on whether the fracture lies proximal or distal to the insertion of the flexor tendon. In general, it is well to omit this differential treatment which may be given this particular fracture in a simplification practice-principle that all digital fractures may be suitably treated by flexion as illustrated. (Figs. 2 and 3.) Fractures of the extreme distal phalanx involve no tendinous pull, hence may be treated with finger extended.

Metacarpal fractures constituted 4.6% of all cases. The more common fractures are situated at the base of the first metacarpal and the neck of the fifth.[5] (Fig. 4.) Clear recognition must be made that fractures of the base of the first metacarpal are of two types. One type does not involve the joint and is characterized by outward, inward angulation of the shaft. This fracture may be simple to reduce, remains stable after reduction, does not require continuous traction and, if treatment is not entirely efficient, disability is minimal. The second type of fracture of the thumb, Bennett's fracture,[6] is a fracture-dislocation in which the articular surface is displaced over the saddle-like trapezium. This

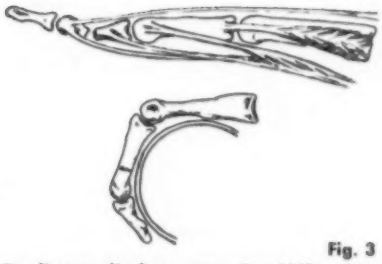


Fig. 3
Tendinous displacement of middle phalanx, corrected by flexion

fracture requires accurate reduction; fixation must be maintained by traction, otherwise the fracture is not stable after reduction. (Figs. 5 and 6.) Traction may be accomplished by the application of moleskin, similar adhesive-tape traction, or through the mechanism of skeletal traction. Traction is attached to a wire-loop or other device incorporated in an immobilizing cast. The terminal phalanx of the thumb may be free for flexion so long as traction is maintained on the proximal phalanx.

The next most common fracture of the metacarpals is the neck of the 5th metacarpal toward which particular attention should be directed in management of reduction and fixation.[7] In this fracture the distal fragment is commonly tilted forward into the palm, resulting in hyperextension at the metacarpal-phalangeal joint. A common though unsuitable form of treatment is direct extension, which will not effect reduction. A particular type of treatment based on the anatomical peculiarities of the metacarpal-phalangeal joint will effect an efficient reduction. It must be borne in mind that the lateral ligaments of the metacarpal-phalangeal joints are relaxed in exten-

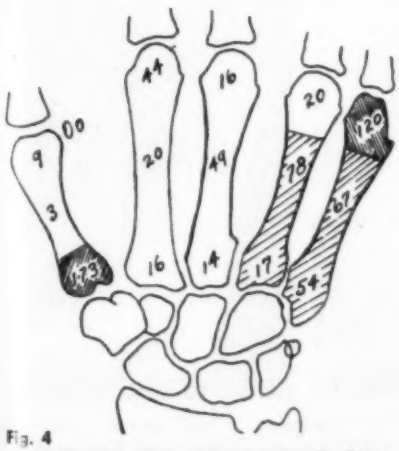


Fig. 4
Incidence fractures of metacarpals: base 1st greatest frequency, neck 5th next

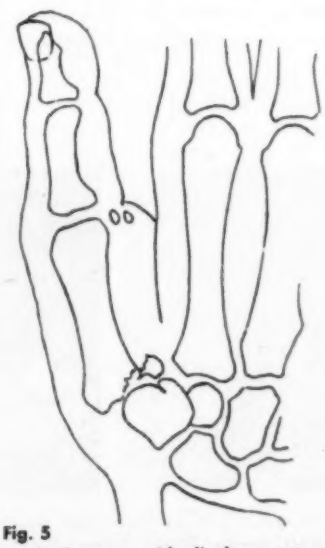


Fig. 5
Bennett's fracture with displacement over saddle-shaped trapezius

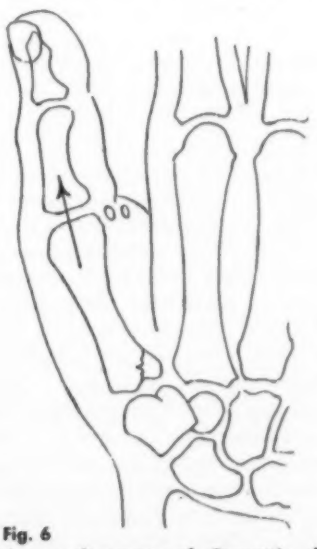


Fig. 6
Traction replacement of Bennett's displacement

Fig. 7
Hyperextension does not reduce fracture because capsul is relaxed

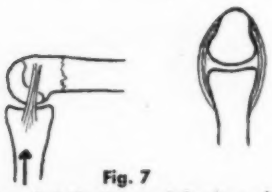


Fig. 7
Right-angled flexion and backward pressure reduce fracture

Anatomical illustration of metacarpal-phalangeal joint characteristics by which hyperextension relaxes and flexion stabilizes joint. The latter position is effective in bringing about reduction of the metacarpal neck

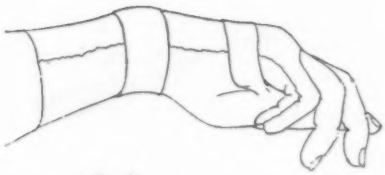


Fig. 8
Dorsal plaster splint for metacarpal fractures

sion, and become taut when this joint is flexed. (Fig. 7.) This tautness is brought about by the lateral bulbosity of the metacarpal head, so arranged that, when the finger flexes, the lateral ligaments stretch firmly over the bulbous head, thus fixing this joint; whereas, in extension, the ligaments are loosened, thus allowing necessary mobility in abduction and adduction of the extended fingers. Knowledge of this fact, therefore, directs that, in reduction of a fracture of the metacarpal head, the metacarpal-phalangeal joint must be flexed, stabilizing the distal fragment. A dorsal plaster cast is applied to the forearm extending to the level of the knuckle joint; after the plaster has set, direct pressure backward on the flexed finger will effect reduction, which is maintained by incorporating the finger in the cast. This immobilization is maintained for a period of three weeks.

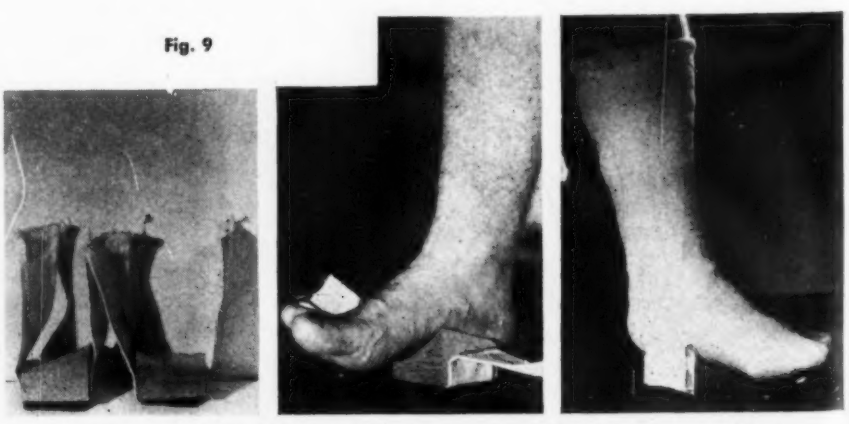
Other fractures of the metacarpals are less common, and occur as spiral or transverse shaft fractures. Spiral fractures usually result in some shortening with overriding. The powerful interosseus muscles usually prevent serious overriding, which commonly obviates the necessity for traction on spiral fractures. Transverse fractures of the metacarpals require additional attention, inasmuch as they may be unstable. The application of a dorsal plaster cast to which the hand is strapped for a period of three to four weeks in the main is sufficient treatment for most of these fractures. (Fig. 8.)

In this series of 371 cases, carpal fractures were not common. However, particular attention is paid to the "sprained wrist," which may prove to be an overlooked carpal-scaphoid fracture.[8] Detection of this fracture requires careful radiological diagnosis with radiograms made in anterior-posterior, lateral, oblique planes, all repeated in three weeks if soreness persists. This fracture may not only escape early detection but also may result in non-union even when immediately detected. Most commonly, blood vessels extend throughout the length of the carpal-scaphoid bone; however, in a significant one-third of cases, vessels enter the distal half of the bone only; therefore, a careful evaluation of the carpal-scaphoid fracture should be made immediately. Fractures of the carpal-scaphoid involving the tubercle commonly show no aseptic necrosis, and all heal when appropriately immobilized. Fractures of the waist of the bone show occasional instances of aseptic necrosis, inasmuch as two out of three cases will have inadequate blood supply to the proximal fragment in waist fractures. Fractures of the proximal pole in two instances out of three result in an aseptic vascular necrosis which is due to the lack of blood supply to the proximal pole. However, if appropriate attention is given to the primary carpal fractures, including early detection and adequate and prolonged fixation, only a small number will result in permanent disability.

Fractures of the lower extremity constitute 31.6%, of which the toes made up 20%, the metatarsals 8%, the os calcis .016%. Fractures of the great toe require particular attention, especially fractures of the proximal phalanx. Fractures of the distal phalanx of the great toe are common injuries, involve no particular problem as regards bone displacement, are immediately painful disabling injuries, and are frequently comminuted, compounded with the loss of a nail. These should result in no ultimate permanent disability. Fractures of the proximal phalanx, however, are subject to more prolonged disability and should be considered of major importance. Fractures of the small toes, where displaced, particularly at the proximal phalanx, require accurate reduction. This can be effected by the insertion of cambric needles through the soft tissue of the toes, the traction loop being fixed through a wire loop incorporated in a plaster boot applied to the lower leg and foot. Union will occur in two and three weeks, at which time traction may be removed.

Fractures of the metatarsal bones occur in 8% of cases. These fractures involve a weight-bearing unit and require very careful attention in reduction-fixation to avoid mal-union, prolonged disability and high compensation claims.[9] The fractures are of two varieties, those with and without displacement. Fractures without displacement may be immobilized in plaster casts without traction. A cast is applied to the leg extended from the tibial tubercle the length of the lower extremity to the toes. Careful attention is given

Fig. 9



Plantar-shaped rubber-heeled walking block for attachment to cast, can be applied during critical setting time of plaster. Cast can be readily split through canvas strips at removal time

Fig. 10
Galvanized-iron metatarsal plate with rubber uplift at tread level for attachment to shoe

to molding plaster about the anterior metatarsal and plantar arches during the setting of the cast, so that there will be an accurate reconstruction of these arches. It is feasible after application of a well-fitted cast to apply a walking device. A simple, immediately applicable wooden rubber-heeled walking-heel is applied, which permits walking after the immediately painful and inflammatory reaction has subsided. (Fig. 9.) Five weeks' immobilization should be allowed for the outer four metatarsals and six weeks for the larger first. On removal of the cast, a special metatarsal uplift stiffening plate is applied to the sole of the shoe. A special metatarsal plate for this purpose is illustrated. (Fig. 10.) The foot and lower extremity are routinely wrapped in an elastoplast dressing for a week or 10 days after removal of the walking cast. The metatarsal plate has been particularly useful in injuries to the great toe, where the toe-cap of the shoe is cut out and the lift on the tread clears the toe from surface contact in walking.

Fractures of the metatarsals with displacement require accurate reduction. Traction may be required for three weeks, followed by the usual molded cast for two or three additional weeks.

Fractures of the os calcis occur in .016% of cases. These fractures are notoriously prolonged in disability and highly rated in permanent crippling. Three general forms of treatment are given three varieties of fracture:

1. Immobilization in plaster, with preliminary manual reduction when displacement is not severe, followed by immediate weight bearing.

2. Skeletal-traction compression reduction with cast fixation and no weight bearing for three months when tuber-angle is seriously disarranged.

3. Early triple arthrodesis in severe intra-articular fractures with ultimate vascular necrosis inevitable.

The pin fixation is avoided wherever possible. Manual disimpaction aided by rubber mallet if necessary, molding, direct plaster cast fixation with plantar flexion 10°, knee flexion 15°, heel laterally compressed in cast during critical-setting time of plaster, maintained 10 weeks, give good functional results in many cases. Ultimate disability results from (1) subastragaloid and mid-tarsal arthritis with spastic talipes; (2) widening of os calcis with submalleolar impingement; (3) relative lengthening of tendo Achilles by upward tuberosity displacement, and (4) traumatic flat foot, valgus heel deformity, tarsal and ankle joint adhesions, or spur formation.[10,11] Frequently severely comminuted fractures terminate in a painless foot because fixation-fusion in the repair period effects an arthrodesis, whereas often simple fractures result in prolonged and painful disability.

Summary

SURVEY of injuries in a modern steel shipbuilding industry which employs an average of 15,788 workmen, experienced 4,912 new injuries a month, with 371 workmen suffering fractures in a nine-month period. Eye injuries constituted 45.4% of all cases seen at the first aid hospital. The incidence of fractures, excluding eye cases, amounted to 1½%. Fifty-four per cent of fractures were minor in character, suitable for treatment in the field first aid hospital, while 45% were major fractures requiring treatment at outside facilities.

2. Fractures of the upper and lower extremities constituted 86.9% of all fractures. Fractures of the hand constituted 37.8%; of the feet 31.6%. Fractures of other bones of the upper extremity were 8.2%; other bones of the lower extremity 9.3%. Fractures of the spinal column and pelvis were 3.9%; injuries about the head 3.9%; fractures of the ribs 5.1%.

3. The high incidence of fractures of the hands and feet necessitates particular attention to this type of injury.

4. Practical considerations in the treatment of these more common injuries are presented.

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AMERICAN ASSOCIATION OF INDUSTRIAL NURSES

—Membership Campaign—

THE AMERICAN ASSOCIATION OF INDUSTRIAL NURSES will, on October 1, launch its drive for new members. This national association was organized in 1942 in recognition of the growth and expansion in the field of industrial nursing.

Though the war has brought an extraordinary growth in this area, some of which will be cut as war industries close, industrial nursing is now established as an important and permanent branch of nursing. It demands an organization whose policies are shaped by those who have blazed the trails in the field of its endeavor, and which will be enriched by the experiences of the new recruits.

Industrial nursing is an integral part of the growing movement to provide safety and health to our great worker population. This movement, instigated privately by industrial management, and officially by city, state and federal governments, is a substantial and growing phase in our country's efforts to prevent accident and disease and to promote health.

The AAIN represents nurses in every field of industrial and mercantile establishments. Its governing board is representative of the country as a whole. Its membership requirements are on a par with those of other standard-making nursing bodies. It has already made material progress through the appointment of an executive secretary, in appointing counsellors in strategic areas for advising nurses, and in laying the groundwork for university and college courses in industrial nursing. Its expanding action program is centered on a sharing of common problems by all nurses in industry, and in aiding these nurses to broaden their usefulness to society.

The AAIN actively encourages

membership in the nursing profession's official bodies, the district, state and national nurses associations. It also encourages the creation of sections on industrial nursing within these bodies, and it works in close harmony with these and all other agencies concerned with industrial and community health.

In this drive the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES appeals to industrial management, physicians and safety engineers, as well as to nurses, to bring word of this association to their nurses. A postcard inquiry will at once furnish complete information to a prospective member. Address MRS. GLADYS DUNDORE, R.N., Executive Secretary, 54 West 10th Street, New York City 11, New York.

Try Cleanliness First

—In Dematitis Prevention—

WILLIAM RUFUS REDDEN, M.D.,
Lecturer in Physiology, and Co-director of the Spars' Training Detachment, Columbia University College of Pharmacy, New York

THE PROBLEM of industrial dermatitis is so great and so important today that a special Committee on Occupational Dermatoses has been chosen in the Section on Dermatology and Syphilology at the request of the Council of Industrial Health of the American Medical Association. This committee has already submitted a carefully considered report.

The importance of cutaneous disorders in industry is further indicated by the fact that the U. S. Public Health Service has a Dermatoses Investigations section, and that auxiliary services have been established in 38 state boards of health and 10 other units, as a result of the promotional program of the U.S.P.H.S. started in 1937.

One dermatologist states that 25 to 30% of a dermatologist's practice is made up of the examination and treatment of industrial cases of dermatitis.

My own studies and the experiences of many industries convince me that many cases of industrial and non-industrial dermatitis can be prevented by keeping clean. In the above-mentioned A.M.A. report, we find this statement: "The simple expedient of installing a few ventilating fans, several shower baths, and clothes lockers in a small factory has, on more than one occasion, saved an individual industry when dermatological procedures alone had failed."

Let us consider some of the factors involved in dermatoses and especially in the industrial variety. Not all skins are alike, nor do they always react in the same way. For example, an examination of more than a million persons from 14 to 16 years of age in England during a four-year period—as girls and boys came up for certificates of fitness for work—shows that for every 100 reasons for conditional and definite rejection, 34.71 were for skin disease. These skin conditions are the result of radical changes going on in the body as the adolescent develops into an adult. A large number of these adolescents reach adult life with skins particularly sensitive to external and internal reactions. In other words, there is an individual variation and susceptibility to skin reactions irrespective of the cause.

Skin irritations and skin diseases are common to all who rub in dirt, grime, or other foreign matter.

As surgeon for the Hotel and Transportation Company of Yellowstone Park for a number of seasons, I had occasion to treat 300 to 400 patients with boils during a four-month summer season each year—chiefly among bus drivers and a group of motorcycle patrols who regulated traffic. The bus drivers developed them on the back of the neck where dust mixed with sweat and skin bacteria and debris was thoroughly rubbed into the hair follicles by the shirt collar and by frequent swipes of the hand and handkerchief. They also developed a few along the flexor surface of the forearms where the rubbing-in process resulted from moving the part against the steering wheel. The patrols developed boils on the neck only. Once the hair follicles became plugged, irritation followed, along with scratching with bacteria-ladened fingernails.

What are some other factors in the development of industrial dermatoses?

Anything, from hot water and mild soap, which are harmless in themselves, to pitch, tar, and arsenic which are definitely poisonous, may cause a skin irritation with a resultant inflammatory condition if these materials come into contact with the skin in sufficient quantities and for a sufficient length of time.

Furthermore, skin or body sensitivity may be developed if a person is exposed repeatedly to some substances. At first exposure, nothing may happen, but gradually, or even explosively, repeated contacts result in a dermatitis or even a general body reaction. This might well be the case with workers in sugar, gardeners who handle hyacinth bulbs, or even housewives who fondle the beautiful blooms of the Japanese primrose. Such cases have been personally observed. It is quite possible that certain persons who suffer from "rubber itch," "baker's itch," etc., might well fall under this group, even though we know that hexamethylene-tetramin used in the rubber industry is of itself toxic, as are some of the newer synthetic rubber products.

More recently such sensitivity to the sulfa drugs has been repeatedly demonstrated when these are used in powder form or as ointments for treatment of dermatoses or wounds or administered internally. In some cases, the local reaction to a sulfa drug has prolonged the dermatitis for months and has caused its extension and increased the severity of the skin condition. With the development of such sensitivity during a minor ailment, the life of the person may be jeopardized if given subsequent sulfa treatment for a serious illness like pneumonia. A number of deaths have already been reported.

Individual Susceptibility

SEASON, temperature, and humidity, working conditions, and the kind of skin play an important part. It has been observed when workers in industries in which cutting oils or dust of various kinds are found become soaked with perspiration there is an increase in dermatoses; and that dry-skinned persons and persons troubled with excessive oil (seborrhea) are more susceptible than normally oil-skinned persons.

Probably part of the answer in regard to heat and perspiration lies in the fact that more dirt is taken up by the perspiration; that the person, in an attempt to keep the sweat out of his eyes and off his hands, brushes his hand and arms across each other, across the forehead, and back of the neck, thus rubbing in the dirt. If the materials handled are toxic, so much the worse.

Moreover, if work clothes are filled with dust and dirt, then become soaked with perspiration or oil or both, every movement of the body as well as the rubbing with the hands and arms grinds in the grime and irritating substances.

"The best protection against infection through the skin is a whole hide." No class of mine in first aid or hygiene and sanitation has ever escaped hearing that statement. Of course, fungus infections and the virus of infantile paralysis may and do pass through the unbroken skin, but the statement still holds.

The corollary to that statement is: "The natural oil on the skin is the first line of defense against irritants and other dermatoses producers." Hence, if the natural skin oil is deficient or is frequently removed by gasoline, benzine, kerosene, turpentine, and other grease solvents, the skin becomes dry, harsh and cracked and the first barrier to dermatosis is destroyed. The same holds true when pumice, sawdust, strong soap powders, harsh and abrasive cleaners or stiff brushes are used.

An oil-protected skin is a defense even against skin cancer caused by some industrial substances. Experiments in England several years ago showed that lanolin applications alternated with synthetic tar delayed tumor development. Where lanolin was applied twice as often, cancer did not appear.

Infection is not the primary cause of occupational dermatoses. When the skin becomes irritated, when bacteria from the skin or elsewhere are carried by dirt, grease, toxic or non-toxic substances into the opening of the hair follicles, the first step toward infection is taken. When itching causes scratching with bacteria-laden fingernails, or rubbing with dirty hands, arms, or clothing, the skin is broken or the walls of the follicles are thinned out and ruptured, thus resulting in the second step to infection—an open door to bacteria into a fine incubator.

When the skin is wiped with coarse burlap, dirty waste or cloths which contain minute particles of dirt and metal, or even when the skin covered with oil and dirt is rubbed with clean waste or clean cloths, the surface is broken and the greatest defense of the skin against infection is destroyed.

With these preliminary statements, we are now ready to consider some phases in the prevention of dermatoses and their control in industry.

Obviously, for materials like acids, alkalis, chromium, which destroy skin oil and skin, there are two answers: provide closed equipment wherever possible; provide workers with adequate protective covering. In other words, keep these skin destroyers off the skin.

Require a more careful reemployment physical examination for every applicant, and a periodic examination of all employees when there is to be exposure to a known toxic substance. Exclude all those with skin disease. Make the frequency of examination suit the toxicity of the material used. In the case of paraffin workers, for example, there should be a daily skin examination.

Have a patch test done on all who are to be exposed to known skin toxic materials and on all who develop a dermatosis after exposure. Anyone can do a patch test, but it takes a dermatologist or other expert to do it accurately, and above all to give it its proper interpretation.

Whenever it is evident that a worker has a susceptible skin, whether this is due to a systemic condition, to a natural dryness, or parchment-like skin, to sensitization of the skin following repeated exposure, or fungus infection with or without epidermophytids, the person should be transferred to a non-exposure task.

Prevent contact with toxic material by a closed process as far as possible and by use of protective clothing such as gloves, aprons, snug clothes, tight at neck, wrists, waist and ankles. As far as possible, have the material impervious to the toxic substances.

It is just as important to remove toxic substances as rapidly and as effectively as possible from the skin without doing more damage.

Fungus infection has claimed more and more attention during the past two decades because of advertising given to cures for so-called "athlete's foot." Since the U. S. Public Health Service estimates that as high as 50 million persons in the United States have this ringworm infection each year, it is obvious that thousands of such cases must appear among employees.

About 15 years ago, it was recognized that persons with ringworm of the feet frequently developed a skin eruption on the hands and on other parts of the body without the presence of the fungus. These eruptions are called epidermophytids or "ids." Today it is well known that people in industry with ringworm with or without "ids" are prone to industrial dermatitis. For this reason, fungus infection should be sought out and cleared up as soon as possible as a preventive of industrial dermatosis.

Consider the problem of dermatoses due to cutting oils and compounds. It is certain that some of the materials used in cutting compounds have an irritating effect on the skin, but the real problem of prevention of oil boils, pimples, and blackheads has little to do with actual skin irritants.

Back in 1918, the Department of Scientific and Industrial Research Advisory Council of London, in Bulletin No. 2, reported that oil rashes are of two kinds: "The first is due to the plugging of the small glands at the root of the hairs on the arms and legs of the workers; the second to mechanical injury to the skin produced by metallic particles suspended in the cutting lubricant . . . Injury to the skin allows germs to enter and causes septic infection."

But later, the work of McConnell, of the U. S. Public Health Service, showed clearly that it is not necessarily the oil or the contents of the cutting compounds that causes blackheads, pimples, and boils, but rather that it is the rubbing-in during the working hours, of the dirt already on the skin before work begins.

He definitely demonstrated that if men thoroughly scrubbed up before work, then applied lanolin or some other oily substance, and repeated the process after lunch with a clean-up before lunch and at the end of the day, no new cases of oil dermatoses developed, and that the same procedure cleared up 80 to 90% of the cases then in existence among the industries investigated.

Less than a year ago, McConnell told me that this cleanliness formula has been successful in the control of dermatitis due to cutting oils and compounds or to printers' ink wherever it has been properly applied. He said also that he frequently receives letters from industrial physicians telling him how successfully this simple cleanliness plan has worked.

General Preventive Measures

BE FAMILIAR with at least the more important occupations that cause exposure to skin irritants.

Have in chart form a complete list of all chemicals used in the plant.

Add to this list a complete chemical analysis of all new materials as they are introduced into old or new processes.

Check against this list all known irritants and those that are known to cause dermatoses.

Substitute, wherever possible,

non-toxic and non-irritating substances for toxic and irritating substances.

Give the workers every protection against known irritating substances. In addition to protective clothing and applications of various types, decrease the daily length of time of exposure by a system of alternation of work wherever possible.

When rubber gloves, protective lotions, creams or ointments are used, make certain the skin is first washed with any good toilet soap and water.

Be sure rubber gloves are properly cared for; this means careful washing in soap and warm water, then thoroughly rinsing and drying. Before use, the hands and gloves should be well dusted with an absorbent powder. Never use grease on rubber gloves.

Provide for cleaning down machines, walls, benches and other surfaces. Make this cleansing frequent enough to keep the equipment and the air free from scatterable dust, and to reduce to a minimum the contact of the workers with oils, dyes, and other substances used in operations.

Make floors impermeable and keep them clean.

Paint walls so they will show up dirt and can be thoroughly cleaned —clean regularly.

Wherever possible, have machinery painted to show up oil and dirt, and keep it clean.

Put the workers in washable uniforms provided by the company and laundered by either the company or the worker. It is much better that the company do it.

Install adequate handwashing and bathing facilities—no plugs in bowls.

Put all toilets, wash rooms, and locker rooms in charge of a cleaner whose sole job is to keep equipment and rooms clean.

Either supply soap and towels, or provide a routine whereby each person has his own.

The removal of industrial dirt or irritants is best accomplished by the use of any mild toilet soap —along with cornmeal instead of a brush. (This avoids the possibility of using a brush that is too stiff.)

When McConnell first attacked the problem of oil boils, he suggested sawdust as an abrasive, but later he suggested cornmeal. But the use of cornmeal is nothing new. In my own family and in many others, I know cornmeal has long been used to get off the grime from whatever source. Such use goes back over 50 years to my knowledge.

Avoid use of strong soaps and powders — harsh and abrasive cleaners. Never use grease solvents of any kind, such as gasoline, benzine, kerosene or turpentine.

Train the workers in the fact that waste used to wipe oil from the hands and elsewhere, even though clean to start with, immediately on use picks up metal and dirt which may break the skin and open the way to infection or cause irritation. Experience has shown that a magnet will pick up plenty of steel particles when the skin is wiped with waste.

The days of taking home a load of dirt on clothing and body are over for workers in wide-awake industries. But, to gain maximum beneficial results, supervise handwashing, bathing, and the change from street clothes to clean work clothes, and work clothes into street clothes.

A serious attempt should be made to develop an *esprit de corps* among the workers that will automatically swing new men into line and keep the old workers in line.

Have a human body cleaner as well as equipment cleaners. Many plants have used a "worker scrubber" who handles humans as laundry. These scrubbers clean the skin of workers who have been exposed to dirt, dust, or oils during the day.

Give the workers sufficient time for routine clean-up on company time: you will find it takes little time once a system is established. You will find also that reduction in lost time will more than pay for the effort and cost.

Before you try fancy methods for the prevention of industrial or occupational dermatoses, try the simple methods of personal and environmental cleanliness. There is no industrial disease that cannot be prevented and even cured to a higher degree by this simple routine.

DR. PILGRIM

RETURNED from an extended study of industrial medicine in the great empire JOHNSTONE calls "the medically-arid West," wherein the few who are engaged in industrial medical pursuits are abundantly fruitful (as to which the pages of this Journal are increasingly eloquent), while the many not so engaged are arid indeed, their dearth of interest even in curative measures being deplorable, and in prevention utterly void. The which throws high lights of special brilliance on the outstanding work of FENN POOLE, A. C. DICK, and "RED" JOHNSTONE, with whom discussed many problems, among them placement, policies, costs, and clinic organizations — through all there being the undertone of the falling-off of workers who are leaving to find jobs more likely to span over into peace times than the building of ships for the air or the trackless sea. . . . AND witnessed a remarkable answer to the query of olden days: "Shall the blind lead the blind?" whereby all meanings except an imperative "shall" have been made no more than the echoes of ancient rhetoric. For HAZEL HURST, and her Foundation for the training and placement of the sightless in industrial jobs (more than 300 of her pupils are now employed in one aircraft plant alone), are worth traveling many miles to see—whereby it is meant that being able to see her and her achievements is a double blessing, in that the observer has the eyes to behold and such wonderful works to cast them upon. For MISS HURST, herself, can see them only with the eyes of the great heart and courageous soul which are exemplified in the philosophy of life she has made her career, namely, that the blind *shall* lead the blind, for thereby they lead themselves. . . . AND then with C. A. WALKER chief surgeon of the largest railroad hospital in the world (Southern Pacific's), discussing numerous—and mostly war-inspired — problems of hospital care. . . . AND interested, too, in an outbreak of cadmium poisoning among fashioners of plated material, wherein this metal was substituted for the others of more accustomed use. . . . THEN with W. P. SHEPARD, to talk of health education, a new development in the same being the weekly news-letter of the Union Health Committee of Northern California. And further on the same matter with WALTER BROWN and PROFESSOR LEGGE, anent the new School of Public Health at Berkeley, wherefor the Legislature has passed the bill, and wherein the teaching of industrial health is to be of particular interest. . . . DISCOURSING, then, with W. FORD HIGBY, of the California Tuberculosis Association, of the work of mobile units in the x-raying and blood testing of workers, and the changes in methods of health education in the last 20 years. . . . FROM whence to see, at first hand, with SIDNEY GARFIELD, CLIFFORD KUH, and BERT HANMAN, the interesting activities of Permanente Foundation (of which more later) and the Kaiser shipyards. . . . AND afterward with CAPTAIN HENRY KESSLER, learning of the great advances in the care and re-education of amputation cases. . . . HOMEWARD, then, by way of Salt Lake City, where was the annual meeting of the Utah State Medical Association, and where was also much stimulating exchange of thought with LEROY GARDNER, PAUL RICHARDS, and LIEUT.-COL. RAYMOND HUSSEY, concerning the correlation

—*Continued on page 712.*

Facilitates Drainage and Ventilation

The individual afflicted with sinusitis knows too well the pressure pain which follows when sinuses are unable to drain readily.

To relieve such conditions, many physicians now use the new nasal decongestant Sulmefrin, which owes its value to desoxyephedronium sulfathiazole—a combination having the proved vasoconstrictive action of ephedrine-like compounds, with the anti-bacterial properties of sulfathiazole.

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Keeping the Faith

WE KNOW of many physicians who have dislocated their entire lives, and the lives of their families, professionally, geographically, and financially, by volunteering for war service. Not all of their assignments have been such that the value of their services could become evident. It is not difficult to realize the sense of futility and frustration with which some of these men have been confronted. Theirs has been a harder lot emotionally in numerous ways than that of the many others whose assignments have been more active, or whose talents and capabilities have had more play. This subject would lend itself to an editorial.

Another basis of editorial comment, especially when large-scale demobilization begins, could be the difference in attitude and psychology between those who have served in a military capacity and those who have remained civilians throughout the war. Not much *may* be said by either the ones or the others directly, but there are signs even now that much *can* be, and *will* be, said indirectly.

A third potential for editorial exploration involves the will to win and the fact that it has served as a cohesive force uniting all groups in the country together. Will the attainment of victory begin to dissolve this cohesion, and, if so, how far-reaching will be the results of the cross currents caused by conflicting aims no longer concentrated on a single purpose?

A fourth field of interest will be education; already it looms large in postwar rehabilitation plans.

And still another subject prolific of expression can develop from the effect on American thought and American life of the travels of millions of men in quarters of the globe never before visited by other than the occasional tourist, businessman, or diplomat. Speculation on this has been under way for some time. What will be the effect on our future and the future of the world resulting from the enforced establishment of temporary residences by so many of our troops in so many foreign lands? This is headed toward frequent discussion by those interested in national, or world, politics, in air travel or in religion, these being just a few of the phases of our lives which will be affected.

It is safe to predict that there will be much written, editorially and otherwise, on these subjects in the not distant future. But we never expect to read a comment covering one of them, let alone all of them, as pithy, as unselfish, and as inspiring as the last paragraph of a letter from an overseas physician to some friends here. We are proud to print it, as a classical expression not only of the spirit of the American Physician in War but also as a prophecy of his rise to the Needs of Peace. It is eloquent of the Real Spirit of Rehabilitation:

"In a few days I will have passed the 55 mark with 25 years of teaching behind me. From any sensible viewpoint it seems silly for me to be here. I am sure that I could have done more immediate good to the war effort by remaining at home. But I remember when I came back from the last war how we felt a barrier between us and our older teachers who had not experienced it with us, and I decided that I would go along with the lads this time in order to keep my ties with them. When I get back I am going to devote all my efforts to making opportunities for these youngsters to repair their educational programs which have been interrupted by the war. Incidentally I wanted to shake myself out of the comfortable grooves in which I was beginning to roll, in the hope that the necessity for adaptation to rapid change would help keep the old carcass young. I am rather inclined to think it will work out that way. More than a little, old age creeps up on us when we surrender to our comfortable habits."

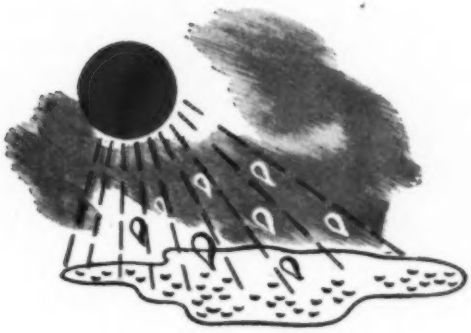
"Doctor, What of the Future?"

DR. RUTHERFORD T. JOHNSTONE, President of the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, sent the following letter to members:

"For the past several years it has been the custom of the writer periodically to inform the members of the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS of its activities. Usually these communications have been designed to stimulate new memberships and to hold the interest of the present members. Now, however, we have passed the period of organization and our stature is of such proportions that we must assume an added obligation.

"Organized medicine is obviously frustrated. From all sides critics contend that the profession has failed to supply medical care to the needy. Regardless of how you, individually, feel regarding the justice or injustice of this criticism, we must all admit social forces will either compel us to adopt some measure to insure medical care for the needy, or will legislate such measures.

"Who are these needy? Are they not for the most part the laboring class—the very segment of the population industrial medicine deals with? Truly the



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challenge can be better met by our branch of practice than by any other. This can be done by furthering the program already inaugurated by industry during this war period. Examination reveals many facets of that program, such as nutrition, dental hygiene, mental hygiene, placement of physical defectives, screening out tuberculosis, cancer, venereal diseases, etc. In many industries the health program extends to the home and the worker's family.

"Is there any objection to this on the part of the profession? Probably so! There will be those who claim that such a program will infringe on the private physician's practice. To a degree it will, but to a greater extent it will create business for him. Most plans of company group insurance permit and encourage the choice of physician. Many workers through periodic physical examinations will be informed of deleterious dental or physical conditions of which they were unaware, and referred to their family physician. The point is that the employer and employee can jointly carry health insurance, a plan feasible for both. Widespread adoption of such a plan would avoid state medicine.

"That industrial medicine holds a key position in the future activities of our profession is apparent from the recent attitude of the American Medical Association. At its last convention in Chicago there were indications that it would assume certain functions and broaden its interests relative to industrial medicine, which it had previously ignored. Building the organized structure of industrial medicine has been done by the hard-working pioneers who years ago formed the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. It is this organization which should hold onto its birthright and not relinquish the functions it has nurtured during these past critical years. To carry out its objective, however, the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS needs the joint aid and encouragement of its component societies, of which we are one.

"The foregoing observation should not be misconstrued. There is no need for conflict with the Council on Industrial Health of the American Medical Association which has done such a splendid job. This Council can well benefit from the support the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS can give it, and in turn serve to cement and advance the interests of industrial medicine with the general profession.

"It was with the realization of the future importance of industrial medicine that the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS reorganized its constitution and by-laws at its last convention. The office of Vice-President was created, the incumbent to succeed the President in office. The terms of the Directors will expire at a set date, thus introducing each year new members to the Board. Most important of all, the future influence of our organization was realized when it was deemed necessary to create a number of committees. These are as follows: Memberships; Constitution and By-Laws; Education and Post-Graduate; Rehabilitation; Industrial Health and Hygiene; Legislative and Public Relations; Public Health; Medical Economics.

"We now come to the purpose of this letter. As you may or may not know, the Association wearied of its Secretary and, to get rid of him, elected him President. As President he needs your help. Since our organization is comparatively small in numbers, most of us know each other and each other's capabilities. Entrusted with the duty of appointing members to the new committees, he would like your suggestions. Won't you take sufficient interest in the welfare of our organization to write me and suggest men qualified to serve on these committees? We want to avoid cliques in our organization—we want active participation from Seattle to San Diego, from the Pacific to the eastern slopes of the Rockies. With your help we can make ours the most active association of its type in medicine."

—*Continued from page 708.*

of the techniques of management and medicine, it seeming that management should be taught what it should expect and can obtain through industrial health services; that schools of business administration might well offer such courses; and that medical schools might likewise teach the management-relationships of health in industry, from which there would result much better understanding. And labor should be included in the mutual educational program, as to which there is now increasing evidence of its interest. Wherefrom this meeting of minds ranged on to other subjects, evolving consensus on a form of medical conference in which there would be brief statements by discussion leaders, to be followed by questions and answers for an extended time—with no more of the inhibiting comments from the one presiding that "we are behind schedule," etc., such as are wont to be heard, so many think, too often. . . . THENCE home—to find the little box of personal belongings from the boy in the service, the sending of which—because he's going across—is every son's ambition, and the receiving of which is every father's pride . . . . and heartache.

INDUSTRIAL MEDICINE on the air, WCFL, 8:45-9:00 P.M., September 11, 18, 25, October 2, 9, 1944.

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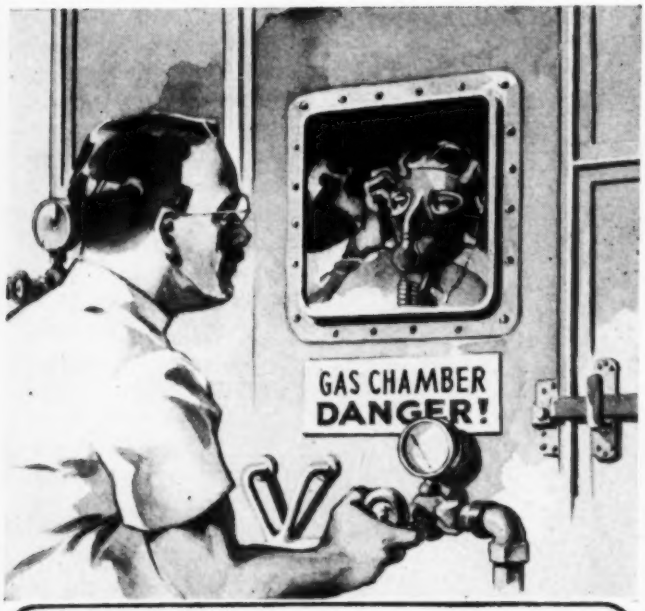

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The Interest of the War Production Board in Industrial Hygiene

JOHN M. FEWKES,
Chief, Industrial Health and Safety Section,
Office of Labor Production,
War Production Board

THE Industrial Health and Safety Section of the Plant and Community Facilities Service has been set up under the Office of Labor Production, War Production Board, for the purpose of reducing the tremendous loss of manpower caused by deaths, injuries and illness in industry because of its effect upon war production.

In 1941, President Franklin D. Roosevelt, writing to the National Safety Council, stated "The battle against carelessness still is far from won, and even greater efforts must be made to win it. I therefore call anew upon the National Safety Council and all other safety forces of the nation to do even more than you have done to stop accidents and speed victory." Paul V. McNutt, Chairman of the War Manpower Commission, stated "When we measure the coming requirements against the current manpower loss from accidents in industry, we have to accept the fact that industrial safety has become a major war problem. We have an untapped reservoir of manpower in the accidents that do not have to happen."

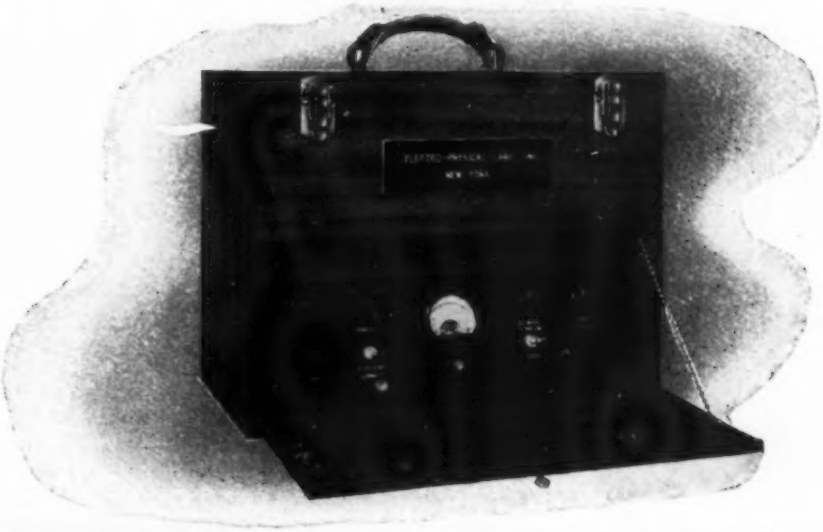
The seriousness of the situation is indicated by the fact that industrial casualties since Pearl Harbor (to January 1, 1944) are 37,600 killed—7,500 more than the military dead; 210,000 permanently disabled and 4,500,000 temporarily disabled—60 times more than the military wounded and missing. Injuries account for approximately 10 times as many lost man-hours as strikes, yet little publicity is given to this fact. Deaths and injuries on the job are occurring now at the rate of 270 million lost man-days a year, the equivalent of the withdrawal of an army of 900,000 workers from the production lines every year.

According to the U. S. Department of Labor news release of January 16, 1944, "The injury total for 1943 is 6% greater than that for 1942, and injuries increased about twice as fast as employment, with the result that the frequency rate increased from 19.9 to 21.0." This release also states ". . . . it must be recognized that untrained personnel working longer hours under more trying conditions require better training and supervision, and that accident prevention efforts must be strengthened and increased. Too many plants have resigned themselves to the entirely unwarranted conclusion that the accident increase is unavoidable under wartime conditions."

The wage loss, medical expense and overhead cost of insurance associated with 1942 occupational accidents totaled one billion dollars. The indirect losses estimated at one billion, three hundred million dollars bring the staggering total of economic costs of occupational accidents to approximately two billion, three hundred million dollars in this one year.

There is no need to explain to industrial hygienists the difficulties encountered in attempting to make similar estimates of the losses sustained by labor, management and the war effort because of diseases and illness. Conservative estimates place the figures at 400 million man-days lost with an attendant financial loss of two billion dollars. Neither do you need to be convinced that the proper use of scientific knowledge now at hand could effect a tremendous saving in

Presented at the Seventh Annual Meeting of the NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, St. Louis, May 9, 1944.



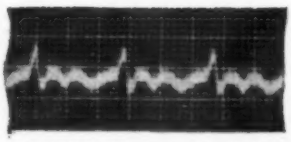


FIGURE A—Photographic Method

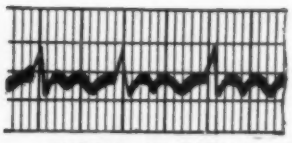


FIGURE B—EPL Method.

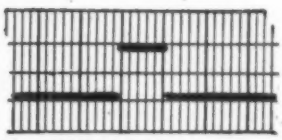


FIGURE C—Calibration

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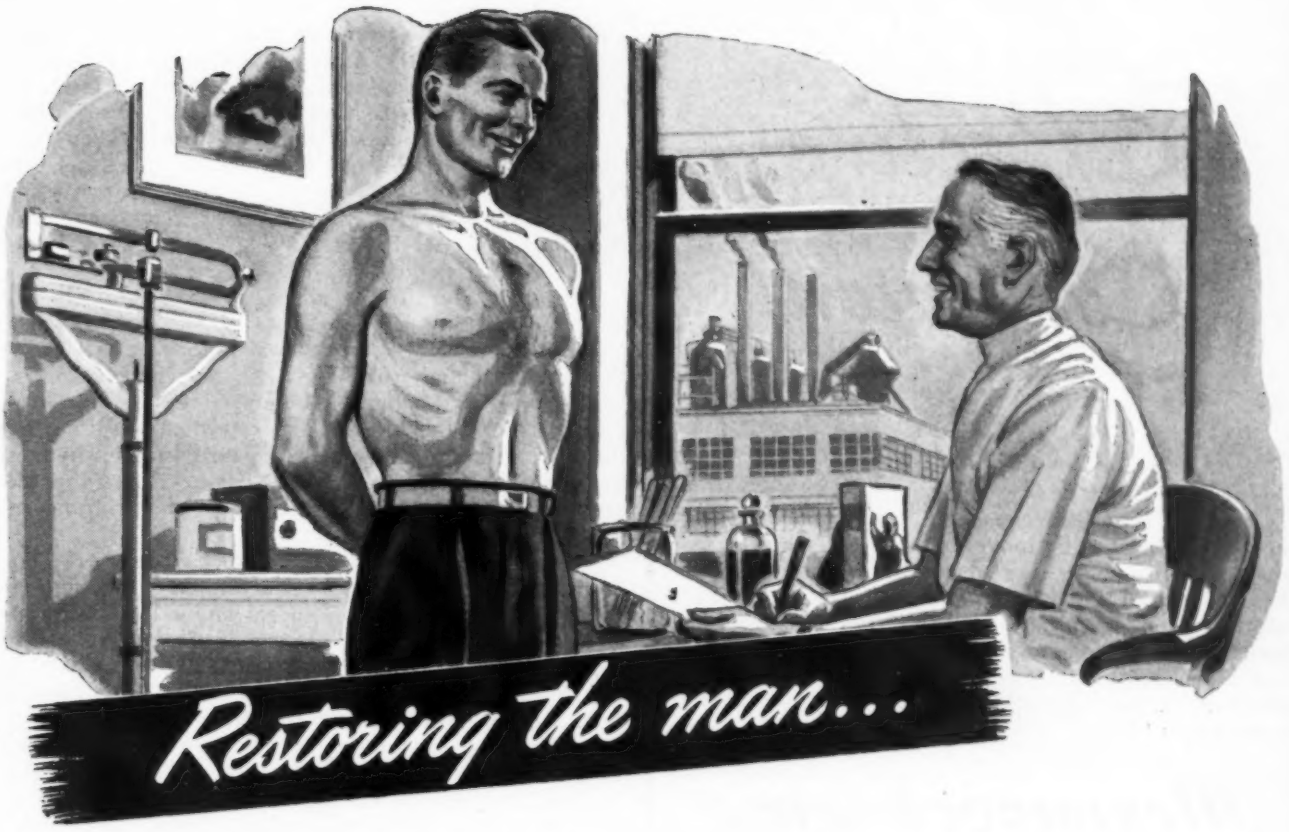
lost man-days of work, money, war production, and human suffering through the prevention of needless illness. We have been told by industrial hygienists and members of the medical profession that occupational and communicable diseases can now be prevented or controlled to a great degree.

The basic responsibility for an adequate health and safety program is that of management; however, the promotion of health and safety should be just as definite an objective of labor as wages and working conditions. It is the worker who suffers the loss of his health, his limbs, and sometimes life itself. No one can estimate the cost of industrial accidents and occupational diseases suffered by the injured workers and their families. Government, both Federal and state, must also accept responsibility.

The recent change in policy of selective service calling for the immediate induction of all deferments between the ages of 18 and 26 and the induction of pre-Pearl Harbor fathers, makes the problem of an adequate supply of labor increasingly critical. Secretary of Labor Perkins set a goal of one million fewer industrial injuries in 1944 before a recent meeting of the Department of Labor's National Committee for the Conservation of Manpower in War Industries. She pointed out that its achievement would amount to about a 40% reduction from the 1943 total of nearly 2,500,000 injuries. This reduction would result in the saving of some 22 million days of work. Figured at 300 days of work per man, it would keep an additional army of approximately 73,000 workers on the production front for the entire year. The correction of insanitary and unsafe conditions surrounding the workers in industry would also have a tremendous impact on absenteeism. Hazards to the health and safety of workers are among the chief causes of lags in labor productivity.

The Office of Labor Production feels that proper attention of responsible agencies directed toward the improvement of insanitary and unsafe conditions will go far toward solving labor shortages and the increasing unrest in the vital industries now experiencing production difficulties, such as the forge and foundry, lumber and logging, and chemical industries. Such an approach to the problem of labor productivity is by far more necessary from the standpoint of cold mathematics than the regrettable yet less consequential effect of strikes. Labor relations in general would be remarkably improved by such a change in emphasis. The War Production Board, in recognition of the importance of this problem to the war effort and of its own responsibility to alleviate it as far as possible, established the Industrial Health and Safety Section in the Office of Labor Production to take appropriate action on behalf of the War Production Board in the area of industrial health and safety. The Office of Labor Production, both because of the authority delegated it with respect to labor productivity and its close relationship to labor, very naturally is attacking problems of health and safety largely through labor channels. Too frequently programs on health and safety fail of their objective because employees are not represented on planning committees by persons of their own choosing. This negligence is not conducive to full cooperation on the part of the employees. To be really effective, a health and safety program must be thoroughly understood and actively promoted by labor. Bearing this in mind, the program of the Industrial Health and Safety Section is being directed toward securing the full participation of labor in the campaign to reduce industrial accidents and occupational diseases.



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A National Advisory Committee, consisting of two representatives of the American Federation of Labor, the Congress of Industrial Organizations, the U. S. Chamber of Commerce, and the National Association of Manufacturers, and a representative of the National Safety Council, has been set up to advise the Industrial Health and Safety Section on its program, policies and activities. This committee has now had two meetings, and its advice and counsel is proving invaluable to the Section.

The Industrial Health and Safety Section has established working relationships with the U. S. Department of Labor, U. S. Public Health Service, the Army Service Command, the Navy, the Maritime Commission, the War Manpower Commission, and the National Safety Council with the view of coordinating the activities of all agencies toward the solution of problems of health and safety that are impeding the production of materials essential to the winning of the war.

The Industrial Health and Safety Section, in conformity with its authorized functions and with agreements reached with the Federal agencies having operational authority and technical staffs, is bringing to the attention of such Federal agencies problems of industrial health and safety which are interfering with war production and which have been brought to the attention of the Industrial Health and Safety Section through the channels of the War Production Board. The Section welcomes knowledge of such hazards and immediately enlists the cooperation of local, state and Federal agencies, labor and management in solving them. We are now perfecting procedures to assure the carrying out of appropriate remedial action recommended as a result of investigation by competent authoritative agencies.

We are endeavoring to encourage more widespread acceptance by labor of its responsibility in the health and safety field. In this connection, we have contacted top labor officials and secured their support and approval of our program, and are initiating an active campaign among labor unions for the establishment of union committees on health and safety at plant, city, state and national levels. We are also urging labor to cooperate in the establishment of plant labor-management committees on health and safety. These we insist should be entirely separated from committees dealing with wage and hour disputes wherever possible.

The Industrial Health and Safety Section is assisting in the establishment of classes designed for labor representatives on health and safety committees through the Engineering, Science, Management War Training program being carried on by the U. S. Department of Labor and the U. S. Office of Education. The ESMWT program has been used to spread the knowledge of health and safety practices from the top down. We are suggesting the logic of now starting a program on health and safety committees. We are also assisting in the dissemination of literature prepared by Federal and other agencies interested in industrial health and safety.

As hazards to the health and safety of the workers must be corrected at the plant level, the details of the above program must of necessity be carried out by the regional and district offices of the War Production Board. The labor representatives in said offices are instructed to work closely with the local, state and Federal governmental agencies in solving specific problems brought to their attention. If they have not already done so, they will be coming to you with their problems. Many state departments have given us won-

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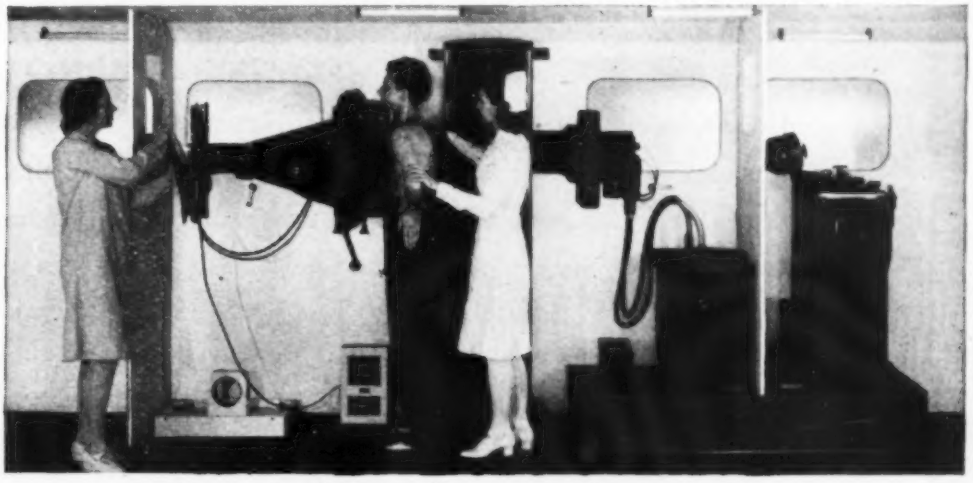

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†Snyder, R. G., Squires, W. H. and Forster, J. W.: A Six-Year Study of Arthritis Therapy, Indus. Med., 12:291-297 (May) 1943

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derful help and cooperation in spite of insufficient staffs that are rapidly being further reduced by selective service requirements, and in spite of the restrictions imposed by inadequate budgets. In turn, we have been able to assist state departments in securing priorities for needed sanitary and safety equipment. The Army, Navy and Maritime Commission have been carrying out a very effective program in health and safety, and are cooperating whole-heartedly wherever they have jurisdiction. The highly competent safety and sanitary engineers on the staffs of the U. S. Department of Labor and the U. S. Public Health Service are giving prompt attention to such matters as are referred to them by our Section. We are planning means of cooperating with the Venereal Diseases and Tuberculosis programs of the USPHS. In most instances, both labor and management, recognizing the great losses involved and their mutual responsibility for the elimination of hazards to health and safety, are found to be very cooperative.

The interest of the War Production Board in industrial hygiene is very real and vital. The War Production Board must have production. Industrial hygiene and preventive medicine are making a significant contribution in facilitating production by maintaining the health of the workers. Each and every worker is increasing in value to our nation every day that the war continues. Military success will come only if we win the battle of production. The War Production Board and the industrial hygienist are naturally drawn together by their mutual interest in a speedy victory and the welfare of the workers in industry.

I would be very ungrateful if I did not take this opportunity to express my deep appreciation of the cooperation that has been given the Industrial Health and Safety Section of the War Production Board by DR. JAMES G. TOWNSEND, COMMANDER J. J. BLOOMFIELD, MAJOR HARRY SEIFERT, MAJOR THALBERT THOMAS, and LIEUTENANT RICHARD PAGE of the Division of Industrial Hygiene, U. S. Public Health Service. The technical advice and counsel of these gentlemen have been invaluable and always available in spite of the tremendous load of work they are carrying.

As our program to decrease the toll of deaths, injuries and illness suffered by workers in industry expands, we know that our need for the assistance of industrial hygienists in Federal and state agencies throughout the nation will increase. We urge you to continue and intensify your efforts and we ask your cooperation in ours.

On behalf of Joseph D. Keenan, Vice-Chairman of the Office of Labor Production, War Production Board, I wish to thank you for this opportunity to lay our program before you and to ask your assistance.

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Standard Reports of Industrial Hygiene Activities

VICTORIA M. TRASKO,
Assistant Statistician,
Industrial Hygiene Division,
Bureau of State Services,
United States Public Health Service

FIVE YEARS have elapsed since the plan for uniform reporting of industrial hygiene activities was adopted at this Conference. As a result of this plan, reasonable progress has been made by the various State and local industrial hygiene units in recording pertinent activities in a uniform manner. The issue, therefore, is not so much the standardization of records as it is the uniform interpretation of these records by each industrial hygiene unit, so that reports will portray adequately industrial hygiene activities.

Objectives of Reports

THE TYPE of report of activities under consideration is the composite functional report prepared routinely by each agency. The primary objective of reports of activities is an accounting of accomplishments and services in order to justify such activities and expenditures of public funds. The second objective is the measuring of progress and the indicating of problems and needs. Another objective is the furnishing of a basis of comparison of progress. In other words, reports are useful tools for administrative and budgetary purposes as well as for the information of others interested in the activities in operation. And finally, reports of industrial hygiene activities should lend themselves to analysis on a national basis. Such information permits planning on a nation-wide basis, allocating personnel and facilities where most needed, and giving intelligent consultation service.

Need for Standardization

WHILE present reports of activities may serve adequately the needs of individual units, they are not uniform for comparability. Despite the fact that industrial hygiene work is closely integrated and motivated by a single aim—safeguarding the health of the industrial worker—the reports are so varied that it is impossible to select a single item of pertinent information for summarization. We are not able, for instance, to state that all 47 units together made investigations of occupational health hazards in so many industrial establishments involving so many workers.

One reason for the lack of uniformity lies in the fact that there still prevails confusion as to what constitutes criteria for measurement of progress. The range of industrial hygiene activities is so broad that it is difficult to make an adequate selection. The fact that there is this difficulty, however, substantiates the need for uniform selection and interpretation of activities. Such standardization will not only improve the usefulness of the reports, but will contribute to a better understanding of the aims and accomplishments in industrial hygiene.

Another reason for considering standard activity reports at this time is that the Industrial Hygiene Division of the U. S. Public Health Service feels that it should discontinue its request for reporting of activities on the form D-a after the war. Only through analyses of these individual reports of investigations are we now able to obtain some idea of accomplishments, problems and needs in the country. At best, the

Presented at the Seventh Annual Meeting of the NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, St. Louis, May 9, 1944.

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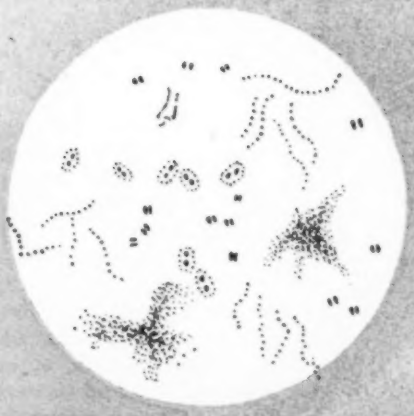

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J. M. A. Georgia 28:332-4 (1939)

In Oravax group, 3.7 days lost per person per cold; in control group, 6.75 days.
Canad. M. A. J. 41:493 (1939)

Oravax 85% to 90% effective against loss of time.
Indust. Med. 8:350-1 (1939)

70.2% of Oravax group free from colds; 7.2% of placebo group.
Indust. Med. 9:530-3 (1940)

***Incidence* of severe colds in Oravax group 1/5 that in placebo group; *duration* of severe colds 0.6 day in Oravax group, 3.4 days in control group.**
Journal-Lancet 60:319-24 (1940)

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results give only a partial picture. The danger of this partial picture is that it is often accepted as a complete story. After the reports are discontinued, the Division will still need to have information on activities for use in planning programs on a nation-wide scale, and in continuing its consultative and advisory services. Unless reports of activities are reasonably standard in form and content, they will be of little value for this purpose.

This leads us to the question, what constitutes a standard report of industrial hygiene activities? A review of present reports indicates primarily a necessity to conform to principles of standardization that will permit uniform interpretation and comparison of at least a reasonable number of activities. Whether reports are prepared on a monthly, quarterly, or annual basis, the underlying principles apply equally well.

Suggested Standard Report

FIRST, activity reports should reflect the complete program as it is being conducted by the unit. They should not be limited to a single phase of activity. As new activities are added, these should be accounted for in the composite report and not treated separately. In other words, the report should contain an accounting of accomplishments in engineering and medical control of occupational health hazards, as well as an accounting of the progress made in the promotion of medical, nursing, dental, and health education services for workers. The report should contain information on cooperative work undertaken with other agencies, and on educational and promotional activities in operation. In brief, the report should furnish an intelligent and streamlined picture of the total activities of the staff.

Second, standard activity reports should have uniformity in recording procedures. The groundwork in such recording has already been laid and many of the problems inherent in recording procedures are being solved. Most of you are familiar with the form D-a which provides for a separate report on each plant investigation. While the main purpose of this kind of form was to permit a consistant analysis of industrial hygiene services to industry on a nation-wide basis, the use of this form helped to achieve uniformity in recording pertinent items of information. The chief drawback to some of the current recording procedures is neglect to revise the forms to conform with growth and changes in industrial hygiene practice.

Third, we must have uniformity of terminology and definition. We should mean the same thing when we use the words survey, study, inspection, analysis, determination. We must decide whether we should continue to use the term engineering when we really mean environmental, especially with respect to surveys and studies. Again, should the type of survey or study be identified according to the profession of the person making the study or according to the service given? For instance, a physician makes a survey of the nursing services in a plant. Should we call this a medical survey or a nursing survey?

Again, we must do our totalling in the same way. For instance, should a visit by an engineer and a physician to an industrial establishment be counted as one plant visit or as two man-visits? Should a recommendation made for protective clothing and another for goggles for the same person be counted as 1 or 2 different recommendations? If 10 workers are exposed to silica dust and 3 different recommendations are made, should we count these 10 workers as affected by 3 recommendations or record them as 30 man-recommendations. These are basic points of difference that defy comparability in evaluating accomplishments.

And finally, we must have uniformity of form and content. The most common form of a report now being prepared is one that combines a narrative story and a statistical summary. The content of the narrative form should not be stereotyped. Its main purpose is to call attention to high lights of activities, special problems, changes in programs and administration, and other facts not covered by the statistical tabulation. The narrative report may interpret briefly the data in the summary, but otherwise it should not contain extraneous statistical information. This is the part that will receive more attention, and it should be readable and stimulating.

On the other hand, the items making up the statistical summary should remain constant. For this reason, only those activities that represent tangible evidence of industrial hygiene work should be selected. This is not as simple as it sounds. One difficulty is that each of the units has its own pet ideas as to what activities should be selected. Another, is the programs, facilities, and the nature of industrial health problems vary from one unit to another. Thus, no matter how wise a selection of items is made, it can hardly be expected to please every unit and answer every individual need. Yet, despite these difficulties, there are certain items that can be selected as representative of tangible accomplishments and that are at the same time capable of common interpretation.

First of these items is the number of plants and the number of workers involved in the investigation of hazards and the evaluation of services. These simple but basic facts are so obvious that there is a tendency to omit them from current reports.

Second, how were the investigations initiated? In other words, how many investigations were self-initiated, how many were made in compliance to requests, the number of investigations resulting from occupational disease reports, and the number of follow-ups on previous studies.

The third item is the type of service given to industrial establishments in evaluating and controlling health hazards and for the promotion of more and better health services. This includes the number of inspections, studies, surveys, and consultations and whether they were environmental, medical, nursing, or dental. If an appreciable amount of work is being done regarding nutrition and health education in industry, it should be accounted for accordingly. This section of the report should furnish some idea of the types of industrial health services that constitute the unit's program.

In connection with the investigative services, there are other facts that may be recorded as indicative of accomplishment. These are the number of field determinations; the number of physical examinations of workers; the number of chest x-rays taken and interpreted; the number of occupational diseases reported, and the number investigated, or found during the course of the visits in industrial establishments. For a report of the laboratory work, it should suffice to mention the number of samples collected for analysis, the number of routine determinations made on these samples, and the number of determinations made in the development of methods.

Another criterion of progress lies in the recommendations made for improvements of conditions and services. In a brief summary it is not practical to list all the specific exposures and conditions studied, for which recommendations were made. If desired, some of the important ones may be mentioned in the narrative section.

In general, recommendations for improvements fall

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into two groups, those made regarding control of environmental conditions; and those made regarding improvements in health and similar services for workers. The first group includes such measures as local exhaust ventilation, enclosure, protective clothing, substitution, etc. The second group includes recommendations for the extension or improvement of medical, nursing, dental and health education services for workers.

In giving numerical expression to this phase of activity, some persons count the number of different recommendations made; others believe that the number of workers affected is a better criterion; while still others use both.

Analyses show that more recommendations are usually made regarding environmental control of hazards than for health services, but more workers are affected by the latter type of adopted recommendation. Thus, we can see how a recommendation calling for the provision of nursing services would affect all 500 workers in a plant, whereas a recommendation for a local exhaust ventilation system to control exposure to carbon tetrachloride in the same plant might affect only a few of the workers. In view of these facts, it might be advisable to give both the number of recommendations and the number of workers affected. This will mean the development of a standard classification list of recommendations in order to insure consistency in counting.

It is not as simple to express statistically the promotional and educational activities of a unit. Some units may record the number of lectures given, the number of conferences attended, the number of publications. Others prefer to extend this list to reports prepared, telephone calls received, and even the number of letters written. These latter are routine activities and should be taken for granted.

Conclusion

IN CONCLUSION, standardization of activity reports in industrial hygiene is a goal toward which we should be working. As long as each unit is required to prepare such reports, an effort should be directed towards making these reports as uniform as possible. Thus, their usefulness will be improved and they will lend themselves to analysis on a national basis.

The Pros and Cons of Standardization

—Round Table Discussion, at the Seventh Annual Meeting of the National Conference of Governmental Industrial Hygienists, St. Louis, May 9, 1944, Dr. Paul A. Brehm, Supervisor, Industrial Hygiene Unit, Wisconsin Board of Health, Presiding—

In Field and Laboratory Procedure

ROBERT M. BROWN,
Supervisor, Industrial Health Service,
St. Louis City Health Division

IN INTRODUCING this subject, I would like to say that I feel the pros of this case are overwhelming. The cons, as I see it, are mostly a matter of execution that we haven't gotten around to, merely because of the pressure of other matters.

We are usually more conscious of the need for standardization when we have a difficult field or laboratory problem to attack. As we begin it, we wonder how this is handled in other states. Unfortunately, data on that subject are usually lacking. We don't know what our coworkers are doing. Or, we may attempt to evaluate our year's program, that is, what have we done in our field and laboratory problems. We attempt this by comparison with the data from other units; whereupon we find either that there are no data or that other units report differently or do their work differently from the way we do it.

What we are interested in, therefore, is, if we do it differently, why do we do it differently, and can't we do it much the same way as others, or take advantage of the way the others do it?

I might say that this situation has gone on in the face of a recognized need and the expressed desire for standardization in field and laboratory procedures. When this Conference was established that situation was recognized, and we attempted to do something about it through our committee on technical standards. This isn't intended as an expression of criticism, but we just never got around to doing what we said we would like to do by way of standardization.

I have been very happy to hear, during the seminar and in private discussions, that we seem to be making progress in arriving at standard procedures. It appears that we are going to be able to do more from the standpoint of acquainting each other with the methods we follow.

Before I say anything further about the standard practice in the field and laboratory activities, per se, I should like to say something with regard to administrative practice. I think we should arrive, if possible, at two important administrative standardizations which affect, I believe, our field and laboratory programs: First, we should adhere, in both our laboratory and field determinations, to a definite minimum standard of thoroughness and completeness based upon established standard engineering analytical good practice. I have noted, in recent literature and comments, that there is a tendency to dispense with thorough field studies, that is, such as we have always considered to be necessary, for the sake of covering more ground. We have also violated this matter of thoroughness, I believe, by the use of untrained, inexperienced personnel, trying to make use of methods and procedures in which they have been incompletely trained or with which they are not familiar enough because they haven't had the experience with them.

This isn't condemnation of a method, but such things certainly have an effect upon the results we get. If we are to command respect in our industrial hygiene procedures we must maintain a minimum standard of quality. Judgment as a substitute for engineering evaluation should not be exercised except by thoroughly trained and experienced industrial hygienists, and even then with great caution.

The second of these administrative standardizations which govern our field and laboratory programs is that we should agree on a standard policy for the type of service we are to render. For example, should the industrial hygienist design ventilating equipment and other control methods, or should he adhere strictly to only checking the design and functioning of such equipment to determine its effectiveness from the health standpoint? I believe very strongly in the latter premise in spite of such arguments as that, if we don't go ahead and design it, it won't be done properly; or, if we do design it, it will be done properly; or, if it isn't done properly to begin with, we are going to have to finish up the job later; or, there are not sufficient consultants in the field to take care of the design of such control equipment. This is a matter which is not strictly a public health function. Again, are we going to adhere to an occupational disease control type of program, or do we go into the adult hygiene type? It is going to become increasingly important that we arrive at standardized procedures in order to get the same effective results.

To mention a few of the present-day trends, we know that there is a definite need for standardization. That was expressed frequently during the recent seminar, and we are pretty well in agreement that it is necessary.

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Each industrial hygienist can be counted upon for at least one pet method or procedure which he champions. He has his variations of the tried and tested procedures. There are probably as many variations of the various methods, such as adding a step, dropping a step, changing a time, as there are individuals doing the work. I have often wondered, if these various so-called standard methods we have now were used by each of us and checked together, could we hope to arrive at the same results from these methods? Consulting various texts and the literature, there is quite a variation in ideas and expressions on methods. There are gaps, I know, in the procedure of many of our units where we do not have what we consider to be satisfactory methods for making certain determinations. But we hear every day that so-and-so has such a method and he is getting good results with it.

As I mentioned, there was action originally sponsored by this group to achieve standardization, a policy which I feel could be continued to great advantage. Some of the states have carried on activities attempting to develop and assemble standard methods for all determinations they are called upon to make. Such activities can and should be coordinated in order that everyone will have the benefit of the labor and experience of the others.

I have had a few ideas as to how this could be done, but I find that these were expressed in substance at the seminar by an outline of what the Public Health Service is attempting to do in this field. In arriving at standardization, it seems to me that, in our industrial hygiene activities the Public Health Service is a logical agency to correlate and sponsor the standard procedures which we can follow. I believe that the National Conference through its members can assist very greatly in this. The effort will be correlated to a considerable degree by the action that was taken this morning in appointing DR. GOLDMAN as chairman of our subcommittee on standard methods, of the committee on technical standards.

In our laboratory and field determinations we feel that we must regularly check our equipment and the effectiveness of our methods. The matter of standardization in striving for new methods and exchanging ideas on the subject follows along with that.

I might summarize by saying that standardization is important and very desirable, and should be worth the time and effort it will take to achieve it. Through increasing the effectiveness of our work, standardization should add prestige to our industrial hygiene program.

In Setting Threshold Limits

MANFRED BOWDITCH,
Director, Division of Occupational Hygiene,
Massachusetts Department of Labor and Industries

I FEEL sure you will not want to leave when I tell you I interpret my assignment as discussion leader as one which does not call for preparation of a paper, and so I have prepared none. I wish merely to present certain viewpoints of my own, which I feel confident will be torn to pieces—and which I hope will be.

We are definitely not here to discuss the pros and cons of certain failures in the present standard of 100 parts per million for carbon tetrachloride in industry. Nevertheless it is the discussion and controversy over this carbon tetrachloride standard which has placed in the forefront of my mind two important questions, and I would like to put those questions before you. In order to do that effectively, I am going to take the liberty of going back into a little history. Some seven years ago in Massachusetts we set up a list of maximum allowable concentrations for about 40 different industrial chemicals, and among those was carbon tetrachloride, which was set at 100 parts per million—at that time, I think, a pretty generally accepted figure.

Those standards of ours were not regulations. We purposely kept them informal because we thought they would need revision from time to time and we wanted to be able to revise them without going to the legislature or through the cumbersome process of changing officially promulgated regulations.

Sure enough, in the course of time, particularly in the last couple of years, we came to the conclusion that several of our figures called for revision, and among them were those for carbon tetrachloride. The original figures had been established with the endorsement of an advisory committee of doctors, engineers, chemists and toxicologists. When it came to the question of revising this carbon tetrachloride figure, we got in touch with as many of that committee as we could under present circumstances. To illustrate that we really made an effort, I will say we got in touch with one member of the committee who was in New Zealand.

We proposed tentatively changing the figure from 100 to 40 parts per million. Every member of our advisory committee with whom we were able to get in touch approved that change. Then one of our committeemen suggested that we communicate with the manufacturers of carbon tetrachloride. More in outward respect for their judgment than for any other reasons, we wrote letters to, I think, eight different manufacturers of carbon tetrachloride. To put it very mildly, they did not concur. We got a barrage of letters, one of which was eight single-spaced pages of grievance, as to why we were all wet. That was followed by a visit from a gentleman from New York who presented me with two business cards, one indicating that he was an official of an advertising agency, and the other that he was an official of an agency devoted to technical research. Of course, it was in his latter capacity that he came to see me. He informed me that he represented several of the carbon tetrachloride producers. I might say that he, also, did not enthusiastically commend our proposed change.

The American Standards Association Committee, which is dealing so ably on the whole with these proposed standards, had this carbon tetrachloride standard before it, and the committee decided to adhere to the standard of 100 parts per million.

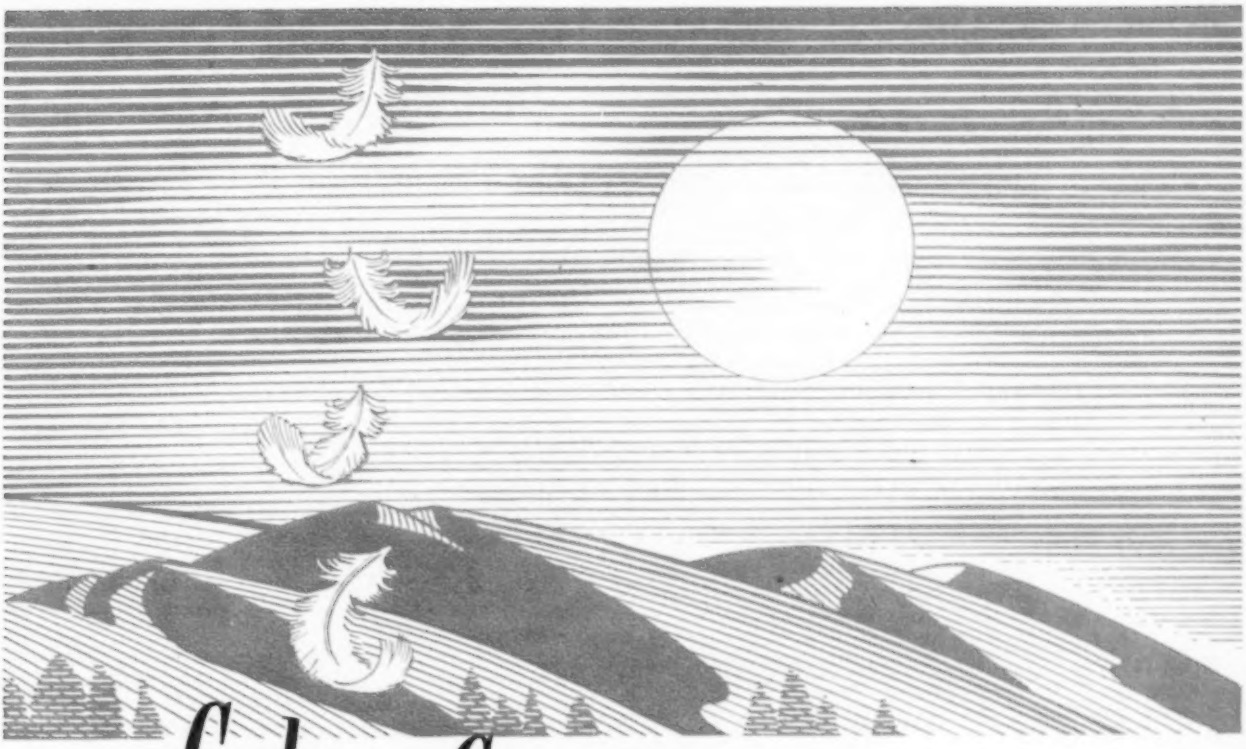
Though I was not present at the meeting in question, I have been told that the principal arguments against lowering the standard for carbon tetrachloride were presented by the insurance men on the committee. While I may be mistaken, it seems to me that it is quite obvious why they should object to such a lowering. If I were an insurance man, I think I would feel exactly as they do, and I don't blame them one bit. It would seem to me that if the standard were lowered from 100, we will say to 40, it would enable industrial workers who had been shown to be exposed to concentrations above 40 but below 100 to make claims and secure compensation which they would otherwise not be able to secure. Perhaps it is not as simple as that, but that is my interpretation.

Certain individuals who were members of our Massachusetts advisory committee and also of the A.S.A. committee reversed their belief previously expressed, and voted for 100 parts per million. Again, I am told that one of these individuals did so with the statement that it was done more or less under protest and for the sake of securing unanimity.

Then, after having passed that vote to retain 100 parts per million, in the face of continued objection from some quarters to that figure, a sort of postscript was added to the proposed A.S.A. standard to the effect that, since it was apparent that conditions of at least temporarily low health, such as nausea, might readily be produced in susceptible individuals by concentrations below 100 parts per million, every effort should be made to work toward lower concentrations. This, in my personal opinion, is merely begging the question.

So much for that little bit of history. The two questions that all of this generated in my mind are: First, is a single figure adequate in dealing with certain of these materials? It seems to me that those of us who are working as preventive agents have to consider, first, the question of actual systemic poisoning; and second, this question of temporary indisposition which, after all, is definite illness even though temporary.

I might say here, in passing, that in writing DR. GARDNER about this, he wrote back that he really would think perhaps he was being poisoned if he lost his lunch twice a week. I certainly would!



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But apart from any actual ill health, in the case where we have certain evil smelling materials which perhaps are more evil smelling than toxic—naturally, I am not talking about carbon tetrachloride—we may have to consider the question of just such unpleasant industrial conditions, conditions under which it isn't fair to expect any human being to work for any length of time. So much for the question of whether we should have one figure or several.

But that also brings up the question of whether the A.S.A. method—for which I assure you I have the highest respect, as I have for the A.S.A. itself, and for MR. AINSWORTH—is as applicable to this type of standardization as it is to the mechanical and other forms of standardization with which they have dealt so largely and so successfully in the past, and for which I assume that the A.S.A. was originally set up.

We are dealing here with standards which can not be arrived at in the same way that we would arrive at the number of threads per inch that should be used on a machine screw of a given size in order to enable everybody to use screws interchangeably. We are dealing with conditions in factories, as to which those of us who are entrusted with the preventive functions have got to use our very best judgment. If a national body like the A.S.A. decides that 100 parts per million is the proper one for safety and our agency in Massachusetts is convinced that that is too high and that safety demands a figure, we will say, of 50, I feel that we would be absolutely false to our trust, false to the citizens of Massachusetts who are employing us, if we did not throw the higher figure out the window and stick to the one which we believe is required for safety.

It happened, quite coincidentally, that only two or three days ago I received from DR. MCDONALD, Director of the Bureau of Occupational Diseases in Baltimore, a letter, of which I brought a copy along. This is dated May 2, 1944, and he says, quite casually, "You will be interested to know that we have changed some of our regulations with respect to permissible concentrations, the standard for carbon tetrachloride now being set at 50 parts per million."

I sent a copy of that to MR. AINSWORTH, with whom I had an extremely satisfactory discussion of this whole question. And I said to him substantially what I am saying now: That it seemed to me that if his organization set up a figure which any substantial number of states failed to concur in—and I have been told since coming to St. Louis that several of the states are thinking along the same lines that we are and that DR. MCDONALD is—the effect would, instead of standardization, be one of producing a high degree of chaos.

I hope we will have some comments on these perhaps radical opinions of mine.

Discussion

DR. HARVEY: I would like to clear up one thing. The A.S.A. has not set up a standard at 100 or 200 or what not. It is in process of setting a standard. I wanted to make that very clear because it has been before them for two years.

MR. BOWDITCH: I didn't mean to imply that they had set a standard. I merely meant that in the deliberations of the A.S.A. committee they had, to date, voted to retain 100 p.p.m., but that, of course, has to go to the codes correlating committee before it can be adopted. MR. AINSWORTH told me, just the other day, that he questioned whether there would be any adoption of that or any other figure in the near future.

WILLIAM G. FREDRICK (Detroit): It seems that in the actual enforcement of industrial hygiene or the application of it in the factory, one has to consider not only the toxicity of the material when affixing a limit, but certainly the nuisance value of the material. This is particularly true with respect to the fumes and smoke and dust that are not toxic in character.

After all, our job is to protect the health of the worker and also make him feel reasonably satisfied with his environment. It is a mighty difficult thing to persuade a worker that his environment is satisfactory if his face is filled with fume and smoke and visibility is poor, even though the concentration of material in the air is well below that which we believe will cause physiological damage.

Then, in regard to exposure to solvent vapor, we know that many solvents will produce simple inebriation or drunkenness probably at levels well below those which will produce injury, real permanent damage, to the worker, but certainly the worker who is inebriated on the job is not a very good safety risk. We don't like to have him on the job half drunk from alcohol, and I think it makes little difference whether he is half intoxicated from alcohol or tetrachlorethylene or petroleum solvent vapors. This is quite aside from the point of whether he is receiving physiological damage.

Accordingly, if we establish limits which do not take into consideration certain comfort features and the elimination of certain nuisance features in the environment, we have a hard time persuading the workers as individuals or as an organized group that the work conditions and environment are satisfactory. We just can't do it.

DR. A. S. ROBINSON (Akron, Ohio): Goodyear has had a problem with carbon tetrachloride in excessive exposure on a Navy contract. The Navy wouldn't consider any substitute, in spite of the research department providing one. So we have the hazard regardless of any state regulations.

In order to determine the cause of the acute intoxications, nausea and vomiting, a group that has maximum exposure is examined periodically. In addition I am running the alveolar air before they start work and at the end of a shift, and getting the concentration of the carbon tetrachloride in their working area. In any recording of acute intoxication or nausea I immediately obtain a specimen of the alveolar air. I haven't had a sufficiently large series to draw any conclusions yet.

DR. FRANK S. LOW: I have listened to all of the remarks both this morning and this afternoon with a great deal of interest. I feel that I represent an organization or group, perhaps, that is in the unfortunate position of getting hell from both sides.

There is just one thing I want to leave with you gentlemen to help you understand our position. We are quite as anxious as any of you to see a standard set that will prevent any injury to any workman and, in so far as possible, any discomfort. It is obviously necessary, I think, that such a standard be set up. For example, we ship a carload of carbon tetrachloride in drums to our Chicago warehouse. We don't know where those drums are going. They will be divided up between five or six states. If those five or six states have different standards, it puts us in an impossible condition. We will have to plaster those drums with instructions and warnings to comply in each of the states in order that these instruction and warnings might accomplish their desired purpose.

Several years ago the manufacturers of carbon tetrachloride—there are five of them, by the way—decided that there wasn't enough accurate knowledge regarding the toxicity of that material. They established a so-called technical committee consisting of one member from each one of the producing organizations, and we made a very careful survey of the literature and agreed that there was no adequate knowledge. So we went back to our respective organizations and raised a sum of money sufficient to finance a piece of work to determine the safe limits. That fund was turned over to DR. HENRY FIELD SMYTH, of the University of Pennsylvania, and he did what, I think, was a very fine piece of research work. It is largely as a result of that work that the present standard in so many states has been accepted as 100 parts per million.

So far as I know, and I have followed the literature as thoroughly and completely as possible, there isn't one authentic case of actual physiological damage from exposure to concentrations as low as 100 parts per million; and I question some of the evidence that has been published concerning the discomfort that has been alleged. In other words, I don't think that the tests, the analytical

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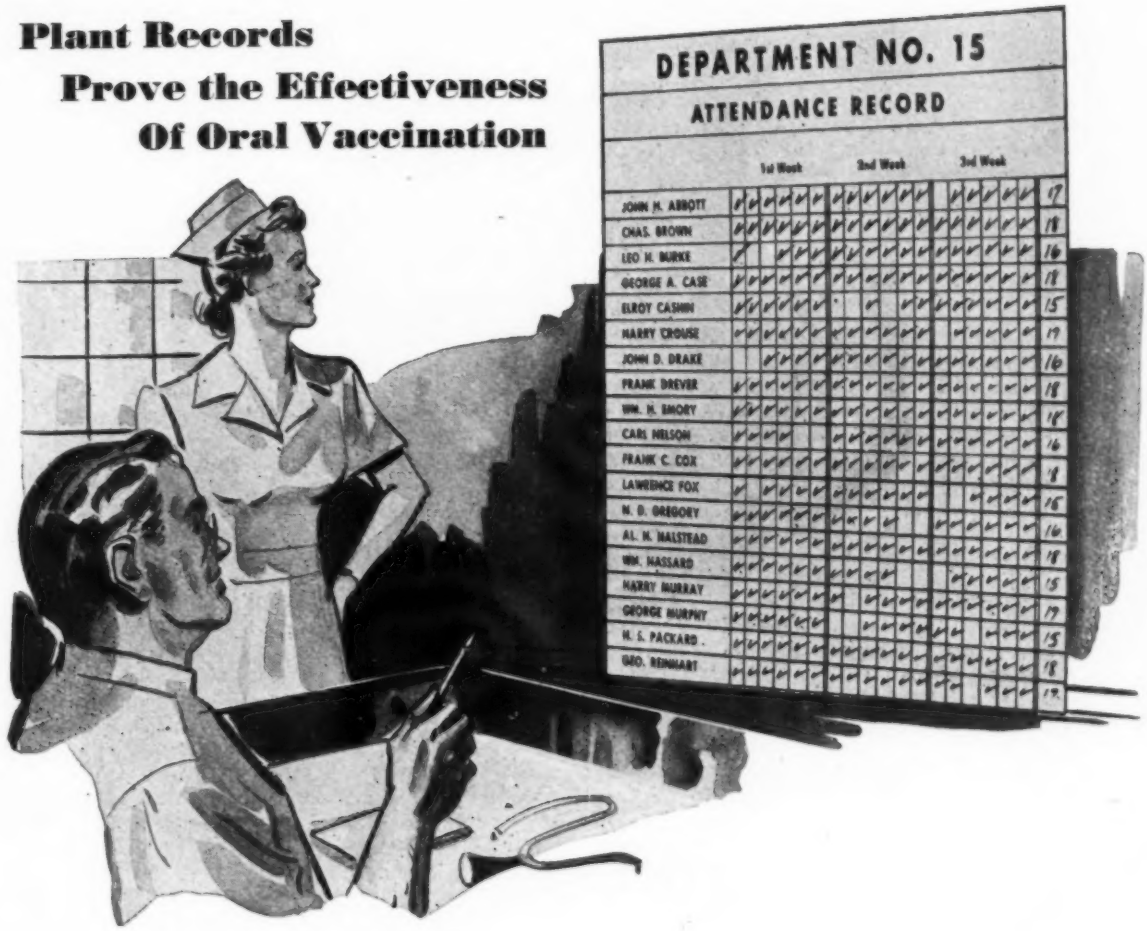

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determinations of the atmosphere, were synchronized sufficiently well with the cases of discomfort so that it could actually be said that 40 parts per million cause nausea and vomiting.

The only appeal I make is that you, who after all are the authorities, will get together and agree on a standard that is uniform and that we can all accept. Entirely apart from the humanitarian motives, it is obviously poor business for us, every time a case of damage or discomfort from carbon tetrachloride or any of the other various chemicals gets into the literature, that we suffer the result in what you might call negative advertising. It is a bad thing, and we don't like it.

I can cite the well-known case in the state of Kentucky where 135 parachute workers were, let us say, seriously discommoded—fortunately there was no serious damage—from carbon tetrachloride. I wrote to the Kentucky Board of Health and inquired specifically if all the containers in which that material was delivered carried the customary warning notice. The Board wrote back promptly that every one of them had carried that notice; and that when the superintendent of the plant was taken out and shown the containers with the warning notice, he threw up his hands in amazement—that was the first he ever heard of it.

I think what we ought to have—in fact the Manufacturing Chemists Association is very earnestly working on it right now—is a means of getting the information regarding the do's and don'ts of how to handle these hazardous materials into the hands of the people who actually use them. It isn't enough to paste a label on the drum. Nobody sees that. We also stamp in red ink on every invoice a similar warning, but the only man who sees that is in the accounting department. We are vigorously working now on a program to make sure that that information is delivered into the hands of the user.

I might add one other point. In the previous discussion the question came up as to how recalcitrant industries might be forced into line. I want to throw this idea out. If any of you state or Federal authorities run into a case of an industry that refuses to cooperate in proper safe methods, if you will communicate with Manufacturing Chemists Association, I think that they will be of very material assistance. I know several cases where the manufacturers have refused to ship to locations where they knew that the material was being improperly used.

CHAIRMAN BREHM: Some reference was made to insurance carriers, and I see there are some representatives in the audience. I wonder if we might hear from the carrier's viewpoint.

DR. E. G. MEITER (Milwaukee): My own personal view on this is that these things really should be bench-marks. They fluctuate up and down, and you don't know at any one time whether you have 100 parts per million or 90 parts per million.

As to the Manufacturing Chemists Association, I think the statement made that the people who do not cooperate should be reported to them is a good idea. In my own experience, while many times it may not be the policy of the manufacturer, the salesmen do tend to minimize the hazards of these chemicals; they nullify what the industrial hygiene unit or the insurance engineer has tried to do.

In many cases perhaps there is not enough information available. I think the limits established should be used as bench-marks only and not considered as, possibly, a law of nature or something of that effect.

WARREN COOK (Chicago): MR. BOWDITCH made one crack at the insurance man that really shouldn't go unanswered. It was that, because of the medicolegal implications, the insurance adviser on the A.S.A. wants to put the limit up as high as possible, not caring very much whether the worker gets poisoned so long as the claim man in the insurance company can say, "Well, the concentration was lower than the limit and so we should not pay the claim."

Perhaps I carried his thought a little further than he intended, but I wanted to clarify the point. From the insurance point of view, the lower the toxic limit and the more adequately the official agencies require manufacturers and users to keep concentrations within that limit, the less the number of cases of occupational diseases from these materials and the smaller the amount of money to be paid out in compensation claims.

My personal thought regarding the ideas, either those expressed so well by DR. MEITER or those expressed in the committee of the A.S.A., is that the individual, whether he happens to be connected with an insurance company or with an official agency, tends to form his own opinion concerning the point at which the toxic limit should be set on the basis of his interpretation of the literature, and on the basis of his personal experience with specific occupational poisons. If in his experience he has found that determinations showed that in one area a number of workers had become poisoned and the concentration of carbon tetrachloride ran 60 to 80 parts per million, his opinion is going to be that the limit should be reduced below 100 parts. I feel it is the background of personal experience rather than the organization with which he is connected that has caused him to arrive at an opinion.

There is one other point I wish to make and that is in regard to somebody's statement that there should perhaps be not one limit but two limits. I am furthering the thought that DON CUMMINGS made a few years ago at an American Industrial Hygiene Association meeting, the thought perhaps best expressed by the term "dual standard": that the concentration to which the man is exposed should not be more than, for example, 3 mgs. of lead per cubic foot of air, but every effort should be made to keep it below 1½ mgs. In other words, we will have a limit which should be maintained, that limit being the threshold where pathological conditions result, but the manufacturer should not be satisfied if he just attains that limit. We should never go above the upper limit, but every effort should be made to keep below another figure which is appreciably less than the concentration known to produce actual toxic results.

I feel that this idea is a step to which many of us would look not only to prevent occupational disease cases but also to avoid discomforting conditions which manufacturers and labor today are making increasing efforts to control.

DR. LEONARD GREENBURG (New York): This is a very interesting and important discussion, and I want to leave one thought with you. If there is any implication that the A.S.A. should give up its efforts at standardization, that would be a step in the wrong direction. I don't think we ought to set up two standards because certainly if we have two standards we are not as well off as if we have one bench-mark, as DR. MEITER said. I think, regarding what MR. BOWDITCH said, that his basic data, perhaps, were not convincing enough. He tells us that he saw some good reason in the beginning for setting up a standard of 100 parts per million. He and his group around Boston did that, and they must have had a good reason to do it. Then, later on, he thought there was good reason to change it to 40 or 50 parts, but unfortunately he couldn't convince some of his own committee, when the issue got really interesting, to go down to that figure because they were willing to go along at the higher value. There must have been some reason why they did that.

I have examined the evidence that MR. BOWDITCH had in one of his printed reports, and I must admit that I didn't think it was too convincing. That doesn't mean the standard shouldn't be lower. I think if evidence is accumulated that it should, we ought to go along with the evidence. But if he wants to support a lower figure, it has to be supported by more factual evidence than he had at his disposal at that particular time when the subject came up for discussion.

I agree with his general principles and policies except with reference to the question of compensation. I don't know how it goes in other states, but my bet is that in most states compensation isn't decided on a basis of how much carbon tetrachloride there is in the atmosphere. It is decided on the questions of, first, has the man got

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evidence of carbon tetrachloride poisoning; and, second, has he been exposed to carbon tetrachloride? At least, that is the way it is done in our state, and I believe, in general, the pattern is about the same. So, I think there is need for more explicit evidence on his point, on the human side, not the animal side.

In closing, I want to say a word about labeling. What is an effective procedure? DR. LOW himself pointed out this afternoon that the men in the plant didn't know anything about it in spite of the fact the bills of lading and drums were marked in due fashion according to law. The fact of the matter is this stuff is peddled all the way down the line. We have repeated instances of some small chemical company using it to make cement; using it to make a stain or varnish remover, or something like that; and there is no evidence at all as to whether it is benzol or carbon tetrachloride or something else.

I think if the manufacturers are as interested in this problem as they should be in order to protect their best interests, they ought to put on their thinking cap and show us the evidence of their good intentions by taking real steps in the right direction.

DR. ALBERT S. GRAY (Hartford): May I say a word in defense of A.S.A.? They are accustomed to making standards of great variety, and what they do when they make a standard is to get in experts in that particular line. I think Mr. Bowditch will agree that experts are on that committee, of which I happened to be considered one for reasons which as yet I don't know. But at any rate, they had what they felt were the best experts in that line and they arrived at 100 parts per million.

DR. GREENBURG: If evidence should be submitted that the standard is either too high or too low, the standard could be changed within a month or even less. The standard is not inflexible.

DR. GRAY: The standard isn't static at all.

MR. BOWDITCH: To DR. GRAY and DR. GREENBURG, I would like to say that I am not running any fight against the A.S.A. I was absolutely sincere in my experience of regard for them and their methods and I always shall be. To my good friend, DR. GREENBURG, I would like to suggest that if he will take the trouble to read some of the writings emanating from his own division, he will find in them evidence which, in my opinion, is ample, quite apart from anything that has ever been published in Massachusetts, to warrant serious questioning of the retention of 100 parts per million of carbon tetrachloride. I would like to add that I think it is very unfortunate that this has degenerated into a discussion of carbon tetrachloride, which I tried to point out in the beginning was not the purpose of the discussion at all.

To my equally good friend, WARREN COOK, I would like to say that the question of deciding on what basis individuals, insurance men or others, form their opinions, is after all merely termed a question of opinion and therefore cannot be replied to. I would like to say to him very definitely that the words, as I understood them from him, which he tried to place in my mouth, bore not the slightest resemblance to what I actually said in my orginal discussion.

Finally, to all of us here, I would like to say that in engineering safety practice there is such a thing as a factor of safety.

A Cooperative Shipyard Study

—By the Public Health Service and the Maritime Commission—

WALDEMAR C. DREESSEN, M.D.,
Chief, Medical Unit, Division of Industrial Hygiene, U. S. Public Health Service

ABOUT a month ago the Public Health Service, Maritime Commission, and Navy launched a shipyards study in Brunswick, Georgia, in cooperation with the Industrial Hygiene Service, State Health Department of Georgia.

We have to date examined some 450 workers. Of course, the general purpose of the survey which we have contemplated is to investigate the health of all shipyard workers, particularly with modern methods of production of ships.

Among the particular complaints of unusual interest is shipyard caulk, of which much has been heard in the last six to eight months. There have been the usual complaints of Leffington fever and other industrial diseases that shipyards' workers are exposed to.

Many of you probably have come face to face with such problems as chest x-rays of men having an unusual x-rayed appearance in the chest suggestive of silicosis, tuberculosis, etc. These men many times have been turned down for induction into military service with a variety of diagnoses, such as silicosis. In other words, there are a great many problems in the medical field that need to be cleared up in various welding operations and other occupations involved in the production of ships.

To get an all-around picture of the problem, we have undertaken to examine 5,000 workers in from six to eight different shipyards located in various parts of the country, starting in Brunswick, Georgia. We will proceed from there to the Alabama Drydocks and Shipbuilding Company in Mobile; and to yards located in Texas, California, Oregon, Washington, and North Carolina.

In each of these yards the people selected will be given a thorough medical examination, including a detailed occupational history and useful medical history, and chest x-ray. Concomitant to these medical observations we have a group of engineers, assistants from the Maritime Commission and men detailed from the Public Health Service, who are making evaluations of the working environment.

We have departed from the usual procedure in the Public Health Service studies where we endeavor to examine every worker employed, on account of the large number of employees in most shipyards. To get around that particular problem we have called in our statisticians to make a sample of all the workers in the yards. This has been made possible by the fact that most of these yards have each employee's name on a card, and with I.B.M. machinery it is possible to pick out cards in order to prepare a list from which we can draw patients in for examination. With that we are very certain we are getting a brand new sample of people employed in the shipyards.

We are proceeding later this month to the work in Mobile, and will continue from there in all probability to Texas and the West Coast. As the work proceeds, of course, we will need and more or less actually solicit the aid of the various industrial hygiene units in the particular place.

Discussion

DR. ALBERT S. GRAY (Hartford): I would like to ask MR. FEWKES a question. In the course of our work in Connecticut, we make recommendations for controlling conditions that need remedying and we sometimes find that the firm endeavoring to get the material cannot get priorities. I am speaking now of plants with prime contracts. The method we have followed, and I am wondering if there is any better method, is to suggest to the firm that if they send to the War Production Board a copy of our report they might get the priority.

So far we have been very successful in securing priorities for the firms under those circumstances because our report contains not only the recommendations but the actual conditions we found, the concentrations to which the individuals were exposed.

Is that the best method to follow?

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Immunologic responses to the so-called cold virus are relatively transient Prophylactic indications, therefore, are directed toward active immunization against bacteria associated with the more severe types of common cold.

Sharp & Dohme, Philadelphia 1, Pa.

1. American Institute of Public Opinion, 1943.

'VACAGEN' *Oral Cold Vaccine Tablets*

MR. FEWKES Yes, it is. That is the proper method to follow. If you do not secure the equipment after having followed that procedure, if you will contact the office of Labor Production representative in your local War Production Board office, they can give you real assistance. If they can't assist you, they send it on to us. In fact, we ask them to send copies to us of all such requests and then from the Washington level our industrial safety section sees what we can do in the War Production Board itself to expedite the securing of safety equipment. Most priorities have been considerably relaxed and health and safety equipment is usually obtainable now.

Tantalum

—A Glimpse of Its Surgical Future—

CARL T. OLSON, M.D.,
Medical Director,
Fansteel Metallurgical Corporation
North Chicago, Illinois

ONE of the most interesting materials to capture the attention of the surgical profession is tantalum. Its use ranks in importance with the other major advances in the military surgery of this war, such as the employment of blood plasma, sulfa drugs, and penicillin. Although it was used in surgery beginning about 1936, progress was very slow in appreciation of its unique properties before the war. However, because of these same unique properties, the military surgeons have found an enormous field for its employment and today the advances in the knowledge of its application have been so rapid as to give rise to almost boundless enthusiasm. But while the military surgeons have undoubtedly gone a long way in developing new applications of tantalum, I believe that, when this metal is freely available to the civilian surgeon, far greater advances will be made.

Perhaps it may be thought that I am over-enthusiastic about tantalum because I happen to be associated with the only producer in the world of the pure metal, but my enthusiasm does not approach that of the men who are using it in their daily work. One of the great tragedies of the war is the disfigurement resulting from battle injuries, and, because tantalum, better than any other material which has ever come to the attention of the plastic surgeon, or the orthopedic surgeon, can be used to restore to normal configuration some of these horrible deformities, the military surgeon feels that he has every right to be highly enthusiastic about it. Skull plates, some of which cover as much as 49 square inches, have been used by the hundreds in restoring areas of the skull which have been shot away. Ears have been fabricated, using tantalum as a framework. Maxillary sinuses have been walled off with tantalum. Bony defects have been bridged with tantalum plates. Artificial mandibles have been inserted, with excellent results. Nerves have been sutured, using tantalum wire and tantalum foil; and the list of similar achievements in its application can be extended on through many other cases.

At this point it might be interesting to review the historical background and some of the chemical and physical properties of tantalum. In 1801, Hatchett, working upon a strange black mineral, noted the presence of a new element which he named columbium because the mineral had been found in North America. Ekeberg, two years later, in 1803, found a second element in the same material. Although he worked for 40 years on it he never succeeded in separating it from the columbium or the other elements in the ore. Because it proved so tantalizing to him, he named this element, which is number 73 in the periodic table, tantalum after Tantalus, the son of Jove and intimate of the gods, and, to carry out the mythological analogy, he named the sister metal, columbium, niobium, by which name it is still known in Europe. One hundred years passed before a fairly pure tantalum was separated out in metallic form. This was accomplished by Werner von Bolton, a Russian subject living in Germany, who produced the tantalum in wire form for use as filament wire in electric light bulbs to replace the carbon filaments. For several years, from 1903 to 1914, tantalum was used as a filament but, because of its greater expense and difficulty in production, it was replaced by tungsten which has been almost universally used ever since. Von Bolton did make small pieces of tantalum, which were used to a limited extent in dental and surgical instruments. However, the cost was prohibitive. During the period from 1906 to 1908, Dr. Clarence W. Balke, while working for his Ph. D. at the University of Pennsylvania, became very much interested in tantalum and columbium and determined their atomic weights. Dr. Balke became associated with the Fansteel Metallurgical Corporation in 1916, and desired the opportunity of going ahead with his work on tantalum. He persuaded the company with which he was associated to allow him to do this, and three tons of ore from the Pilbarra area in Australia were transported by camel back 450 miles to the nearest seaport and shipped to Chicago. The war intervened and Dr. Balke's attention was diverted to many other war problems, but in 1920 he resumed his work on tantalum. In 1922, after many trials and failures, he produced a very pure tantalum which could be fabricated in the form of wire and sheet, or machined in many different ways. Although this work was started without any idea of what the possible market for tantalum might be, it was soon discovered that it acted as a "valve" to the passage of electric current, and it was immediately put to work in the famous Balkite rectifiers which were used in many different locations but had a large range of application during the twenties because of the newly developed home radio sets which operated from batteries. On account of the peculiar properties of tantalum, it found a large field in the tubes used in electronics, in the manufacture of chemical equipment, and in the making of alloys for cutting tools. It would not be an exaggeration to say that our military operations could not have been so successful had it not been for the application of tantalum to the problems of electronics and in other forms.

Address given before the staff of St. Francis Hospital, Breckenridge, Minnesota, August 17, 1944.

The Special Properties of Tantalum

NO ONE knows how extensively tantalum occurs in the earth crust. At the present time there are 10 places where tantalum ore can be obtained: Belgian Congo, Brazil, Nigeria, Australia, Rhodesia, Uganda, Argentina, New Mexico, South Dakota and Colorado. It is believed by men who have given this problem thought that tantalum does have a fairly wide distribution but, because it has not been in great demand until this war came along, there has not been enough exploratory work done to determine just how plentiful the supply of ore may be in areas other than those mentioned. Tantalum occurs in the form of iron and manganese combinations of tantalum, and is always associated with columbium. If the ore contains a greater amount of tantalum than columbium, it is known as tantalite, but, if there are greater amounts of columbium, it is known as columbite. It requires

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enormous amounts of material to be handled to produce appreciable quantities of high grade ore. In the Black Hills district approximately two and one-half tons of rock must be mined, milled, concentrated and processed to produce one pound of tantalum. Putting it another way, the mining and milling of 100 tons of rock produces an average of 314 pounds of tantalite concentrates, which yield about 40 pounds of metal. In the Brazil district, at least 3,000 tons of material must be handled to produce one ton of good tantalite concentrate. The percentage of tantalum in the concentrates will vary from 5 to 65%.

Tantalum can not be obtained by the ordinary method of smelting, such as is used in the iron industry. Its extraction has to be done by chemical means. The early method was to apply pure sodium to sodium tantalofluoride, but although this will produce tantalum it is not a particularly good method. In general, the present-day method is to extract the columbium and tantalum from concentrated ore in the form of double fluorides. The two are then separated, using their different solubilities in water. The double fluoride of tantalum is then placed in a electrolytic bath, using the cast-iron bowl as cathode and having an anode of pure carbon. In the electrolysis which takes place pure tantalum is concentrated on the cathode. From here on out the production of tantalum falls in the field of powder metallurgy. The tantalum powder is placed in a slotted press and enormous pressures are exerted upon it so that a bar is formed which will hang together, but does not have any strength. This bar is then placed in a vacuum furnace and heated to a point which is just below the melting point of tantalum. This process is known as sintering. After the bar has been properly sintered, it is cold-worked by passing through rolling mills, or it is swaged down so that it can be drawn in the form of wire. If it is desired to obtain a pure product of tantalum all of this working has to be done either in a vacuum or "cold-worked." In the process of "working it" tantalum has a tendency to become brittle owing to stresses and strains set up by working, and these have to be removed by annealing, all of which has to be done in a vacuum. It is possible to run out the tantalum foil to a fineness of ¼ of one thousandth of an inch, and the wire may be drawn down to one thousandth of an inch in diameter.

Pure tantalum is a bluish white metal with a density of 16.6, which means that it weighs approximately twice as much as steel. A cubic foot of tantalum weighs 1034 pounds. As regards strength, unannealed tantalum is comparable to cold rolled steel, while annealed tantalum may be compared to annealed steel. In ultimate strength, fine-wire and thin-sheet tantalum are quite similar to steel. For hardened tantalum the yield and breaking points are practically identical. Tantalum is quite ductile, and is comparable to nickel in its ability to be drawn, stamped or formed into complicated shapes. It becomes work-hardened at a rate much lower than most other metals. A reduction in thickness of 60% or more without intermediate anneal is common practice. Tantalum may be machined with ordinary steel tools if carbon tetrachloride is used as a cutting compound; and it welds perfectly to itself and certain other metals by electric spot, butt, seam and roller processes. It may be arc-welded to itself, but the process is difficult and can be accomplished only by a very special method. By a special process tantalum can be hardened to any desired degree from 150 to 600 Brinell. Unusual resistance to erosion is characteristic of tantalum even in a soft stage. When hardened its resistance increases so that it withstands the action of high velocity steam or liquid streams. The thermal conductivity of tantalum is approximately the same as that of steel. As to thermal expansion, the linear coefficient of expansion of tantalum is approximately half that of common steel, four-tenths that of copper, and three-tenths that of silver. So much for the physical and electrical properties of tantalum.

Chemical Properties

IT IS THE additional chemical properties which make tantalum so valuable to the surgical profession. So far as is known, no organic acid, salt, gas, alcohol, ketone, aldehyde or ester has any effect upon tantalum. Specific exceptions however, should be made for such reagents as may contain fluorine, free SO_3, or strong alkalis. The only acids with which tantalum must be considered with caution are hydrofluoric, fuming sulphuric, sulphuric, and phosphoric, the latter two only at high concentrations and temperatures. Tantalum may be safely used with concentrated sulphuric acid at temperatures up to 175° C, and with concentrated phosphoric acid at temperatures up to 145° C. It has an excellent resistance to weak alkalis, and to very dilute solutions of strong alkalis as long as local concentration can be avoided. It is inert to salts, dry, wet or dissolved, excepting those which contain, or hydrolize to, strong alkalis. Hypochlorites do not affect it unless they are strongly alkaline. The same is true of all chlorides, bromides and iodides.

As to gases, at temperatures below 150° C, nearly all corrosive gases have absolutely no effect upon tantalum. Fluorine and hydrogen, however, particularly if under pressure, are exceptions. In general, it may be stated that for all temperatures under 175° C, tantalum does not combine with gases. At higher temperatures it reacts with other gases, and at very high temperatures it will combine or react with most of the elements. Mercury and the noble gases apparently do not combine with tantalum at any temperature up to the melting point.

What does all this mean so far as the medical man is concerned? It means that we have a material which is completely inert to any chemical that may be produced in the body. It means that tantalum can be put into the body and will not break down under any circumstances. It means that there is no likelihood of any electrolytic action taking place as long as an all-tantalum set-up is used. It means that it cannot produce any reaction on the basis of radioactivity. It means that there can never be any solution of the metallic tantalum placed in the body. It means we have a material which is easily handled in the form of wire, plates, tubes, or foil. All of these things are theoretically true.

Does the practical application of tantalum bear out the theoretical considerations? Decidedly, the answer is in the affirmative. Tantalum has been used in thousands upon thousands of cases to date, and most men are agreed that they have never seen any foreign body reaction to it. I have used it for a period of a year in the form of skin sutures, tendon sutures, and foil dressings. I have consulted with other men who have used it in bone work, and nerve and brain surgery, and the opinion of these men is that there is by all odds less reaction with tantalum than when any other material is used. It has the added factor that it can be machined and worked at the table, whereas other metal alloys which claim to be inert have to be cast.

Although theoretically tantalum is biologically inert in that it is insoluble in body fluids and has no special properties such as radioactivity, the healing which takes place in the presence of tantalum might lead one

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to suspect that there was a biological reaction. In my own experience I have a series of well over 50 hand injury cases where the only suture material used was tantalum and the dressing consisted of permeable tantalum foil placed against the skin, with gauze over the foil. The technique used in hand injury cases consisted of thorough washing, with a bland soap and water, of the entire hand, with the patient, surgeon and nurse properly masked, and the usual aseptic set-up. No antiseptics or chemicals of any kind, except the soap and water, are used in the preparation of the patient. The tantalum wire is sterilized by boiling, as is also the foil. In this series, which covers the past year, I have not yet seen the slightest sign of tissue reaction to the tantalum in the form of necrosis of the tissue or suppuration. The initial wound dressing is not removed until a period of nine days has elapsed. The results have been so invariably good that on all new cases before I remove the dressing I know almost for a certainty that there will not be any infection, and that healing will have progressed to a very satisfactory state.

Wound Dressing

OLIVER COPE, of Boston, has stated, "The optimal care of the burn surface consists in covering it promptly with a dressing impervious to bacteria and one which contains nothing injurious to cells."

In the Manual of Dermatology, issued under the auspices of the National Research Council, on page 152, the statement is made and italicized, "It is recommended that the usual surgical gauze be entirely abandoned as material for dermatologic dressings applied directly to the skin."

Because the usual methods of dressing wounds do not seem to be entirely ideal, I have proceeded with the idea of using tantalum foil, since it is non-irritating and is easily sterilized. My experiences with foil as a dressing have led me to believe that there is a large field awaiting the use of tantalum. For example, I have used tantalum foil on small areas of second degree burns, going through all of the Koch-Allen technique, viz., thorough soap and water cleansing, masking of attendants and patient and placing sterile foil over the burned area and applying compression dressings. My results are so good that I believe this work should be carried further. Also, I have used tantalum foil on denuded areas where partial thickness of skin has been lost, either from trauma or as a donor site. Although there has been no control work on this, it is my impression that the rate of epithelialization has been remarkably rapid under the foil as compared with the usual vaseline gauze dressing. Tantalum foil also has been used over skin graft areas and the results have been very good.

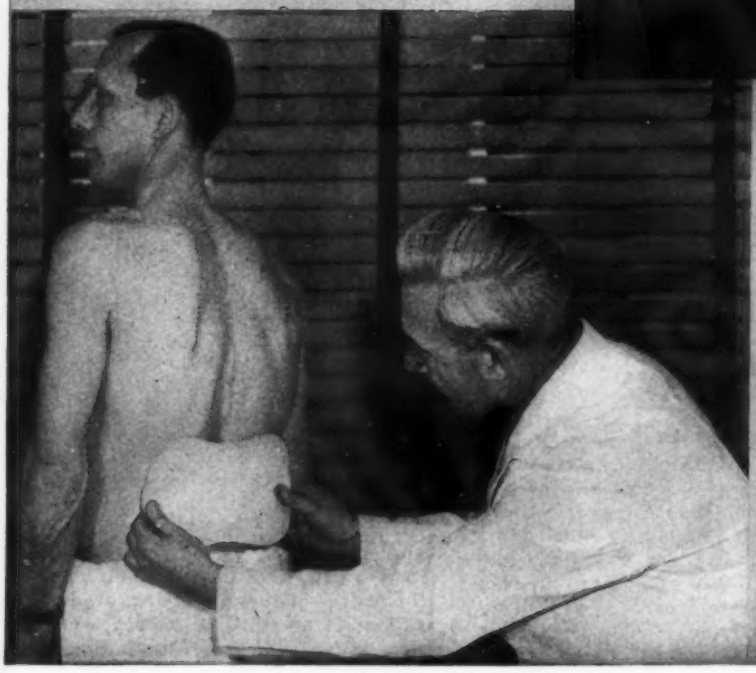
There are some disadvantages to the use of foil. In the first place, the foil can only be obtained in widths of approximately four inches and it is likely to fragment. It has a tendency to adhere very firmly to the underlying tissue. If the area of skin underneath is large there is the disadvantage of the accumulation of sweat underneath the foil. I have attempted to overcome this by running off a permeable foil, but it is not highly successful as yet. I believe that if a cloth were made, using .002-in. wire with a properly worked out mesh, this objection would be overcome along with the fragmentation and difficulty of following the natural curves of the anatomical parts to be covered. At the present time there is a request in for some cloth to be made, and it will be very interesting to see what the results of the wire cloth will be. I have also used tantalum foil in certain dermatological conditions, such as atopic dermatitis, and believe it has a field for usefulness there.

The neurological surgeons have become very enthusiastic about the use of foil. When the foil is placed in a wound there is an almost complete absence of fibrosis. This has led the peripheral nerve surgeon to use the foil when he does either a direct suture or a nerve graft. The nerve ends are brought together with fine tantalum wire, 0.003, and a few stitches are placed in the neurilemma. This line of suture then is wrapped with foil for a distance of at least one inch back from the line, and the foil is left in permanently. In a large series of cases very excellent results have been reported, Lt.-Col. Spurling stating that the restoration of function takes place in one-third less time using the tantalum technique. In the skull where there is an osteal defect, foil may be used to take the place of the arachnoidal layer, preventing scar formation from impinging upon the brain substance, and a plate may be fashioned out of 0.015-in. tantalum sheet to cover any bony defect. This plate is put in by countersinking the edge of the bone, placing the plate in position and using tantalum inserts much the same as a glazier uses zinc points in placing a glass in a window frame. A good many hundreds of these plates are already in the skulls of our wounded boys. Richard Tregaskis, author of "Guadalcanal Diary," is quite proud of his tantalum insert. In regard to bone work, tantalum screws and tantalum plates have been used now for more than seven years without any evidence of foreign body irritation. As a matter of fact the regeneration of bone in the neighborhood of tantalum is quite remarkable. There are instances in laboratory animals where defects in the skull amounting to three inches in diameter have been completely covered over with bone following the insertion of tantalum plate to cover the original defect.

Petronius, one of the earliest surgeons to propose the use of metals, in 1565 devised a gold plate for the repair of defects of the cleft palate. Venable and Stuck[1] have reviewed the history of buried metal appliances in surgery, running through the gamut of gold, silver, iron and steel, aluminum, magnesium, brass, and various alloys. In 1936 they performed a number of animal and chemical experiments in which they found definite evidence that all the metals commonly used in surgery were subject to electrolytic activity in body fluids. Also, they found that the evidence of tissue damage was roughly equivalent to the amount of galvanic action which took place between the metals. As new industrial alloys have been developed and tried as buried surgical appliances in the body, it has been found that they succeeded ONLY IF they were passive or free of electro-activity in normal human serum. Three such materials have undergone considerable use and investigation. They are vitallium, tantalum, 18-8-SMO stainless steel. Vitallium is an alloy of cobalt, chromium and molybdeum; 18-8-SMO stainless steel contains 18% nickel, 8% chromium, 2 to 3% molybdenum, and the remainder iron, manganese and carbon. It is not my purpose to enter into comparison of these three materials except to state that tantalum is the most ideal because it is as ductile and as tough as stainless steel and yet is inert and electro-passive in the body fluids. The first work with tantalum surgery was done by Burch and Carney at Vanderbilt University and by Burke, of Canada, in 1935-36. There are many investigations going on at the present time in regard to tantalum. Most of these are under military auspices and not a great deal of the material is available for public information. As soon

1. Surg., Gynec. & Obst., 76: 297-304, April, 1943.

When Muscle Pain Strikes



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as the war is over we are expecting a flood of literature on the surgical uses of tantalum. I can assure you that whatever information you get concerning tantalum will be well worth your attention, and that the application of tantalum to your surgical problems will make those problems easier.

NEWS, COMMENT and OPINION

—*Continued from page 40.*

ONLY 13 of the 13,691 cases brought before the State Industrial Commission during July were caused by occupational ailments, the commission's monthly report showed today. July was the first month that occupational disease cases were covered by the Workmen's Compensation Act. Sixteen of the July accidents were fatal, or 11% less than for July last year, and 62% less than in July, 1942. The total accidents number showed a decline of 28% as compared with July, 1943, and 50% under July, 1942.

—*Richmond, Virginia, News-Leader,* August 4.

Cancer and Accidental Injury

COURT decisions "that single accidental injuries have caused cancer or can cause cancer should be appealed to tribunals which will give the problems involved adequate competent attention in the light of present knowledge," *J.A.M.A.* for May 27 advises in an editorial which points out that the theory that cancer can be caused by a single accidental injury is not supported by prevailing scientific knowledge of the cause of cancer. *The Journal* says: "Under workmen's compensation acts cases involving cancer fall in two groups, one in which the injury is claimed to have caused the cancer and one in which it is claimed that the injury aggravated cancer existing before the injury. In respect to the first group, the laws appears to be that where 'a normal healthy individual receives in injury by accident in the course of and arising out of his employment and thereafter his health steadily declines and a cancerous condition in the vicinity thereafter causes the (disability or) death of the employee, the causal connection between the injury and the cancer is established and the (disability or) death is compensable under the workmen's compensation act, on the theory that the cancer was caused by such injury.' To prove that the cancer is an 'accidental injury' the following four elements must be present: serious injury or strain, physical connection between the injury or death, proper lapse of time between the injury and the disability or death, and freedom on the part of the employee from cancer at the time of the injury. . . . The theory that cancer can be caused by a single accidental injury is not supported by prevailing scientific knowledge of the causation of cancer. Its only support would seem to be the fallacy of 'post hoc ergo propter hoc.' Unfortunately, legal authorities are willing to accept such crude reasoning as if it solved the cancer problem. In spite of the humanitarian intent of the declaration that a single accidental injury can cause cancer, justice has not been done and the public is receiving a wrong impression in regard to the cause of cancer. . . ."

—*Illinois Med. J.*, August, 1944.

Treating Cable Rash

ACCORDING to T. P. CONNELLY and W. C. MARCH (*U. S. Naval Med. Bull.*, 42:403, 1944) cable rash, now becoming more common in shipyards, arises from contact with waterproofed and fireproof cable impregnated with chlorinated naphthalene, chlorinated diphenyl or chlorinated diphenyl oxide. In treating this condition, these physicians recommend nightly application of the following preparation after thorough cleansing of the skin. (It is to be washed off in the morning.)

Potassum sulfide (50% solution, filtered)	60.0 cc.
Zinc oxide	30.0 Gm.
Precipitated sulfur	30.0 Gm.
Glycerine, C. P.	5.0 cc.
Soluble fluid rose	1.0 cc.

—From "Glycerine Facts," issued by Glycerine Producers' Association.

Seattle Conference

SEATTLE (Washington) was the scene of a Wartime Conference on Industrial Health, sponsored by the Seattle Safety Council, on August 30, 1944. DR. LLOYD M. FARNER, Chief, Division of Industrial Hygiene, State Health Department, was co-chairman of the conference arrangements committee. Among the speakers were DR. DUDLEY A. IRWIN, Director of Medical Research, Aluminum Company of America, Pittsburgh, who talked on "Industrial Health of Tomorrow;" and DR. WARREN B. PENNEY, past president, Washington State Medical Association, and DR. J. L. JONES, Chief, Bureau of Medical Services, State Health Department, who spoke on "Industrial Health—a Four-Fold Responsibility."

Silicosis Board

KENTUCKY has established a permanent medical examining board, paid by the state to examine all claimants alleging disbility by reason of silicosis. Two radiologists and one chest physician make up the board; they are DRS. ISAAC T. FUGATE, Louisville, three-year term; CHARLES C. MCCOY, Louisville, two-year term; THOMAS A. FRAZER, Marion, one-year term. All cases will be referred to the examining board for diagnosis, and the conclusions of the examiners will go to the workmen's compensation board, operating under the department of industrial relations. The silicosis law in this state permits a finding of partial permanent disability, and contains a "second-injury clause." This law was rewritten following a survey by the state department of health and the representatives of the Associated Industries of Kentucky, two national unions, insurance carriers, and employers.

Gable, to Wake the Audience

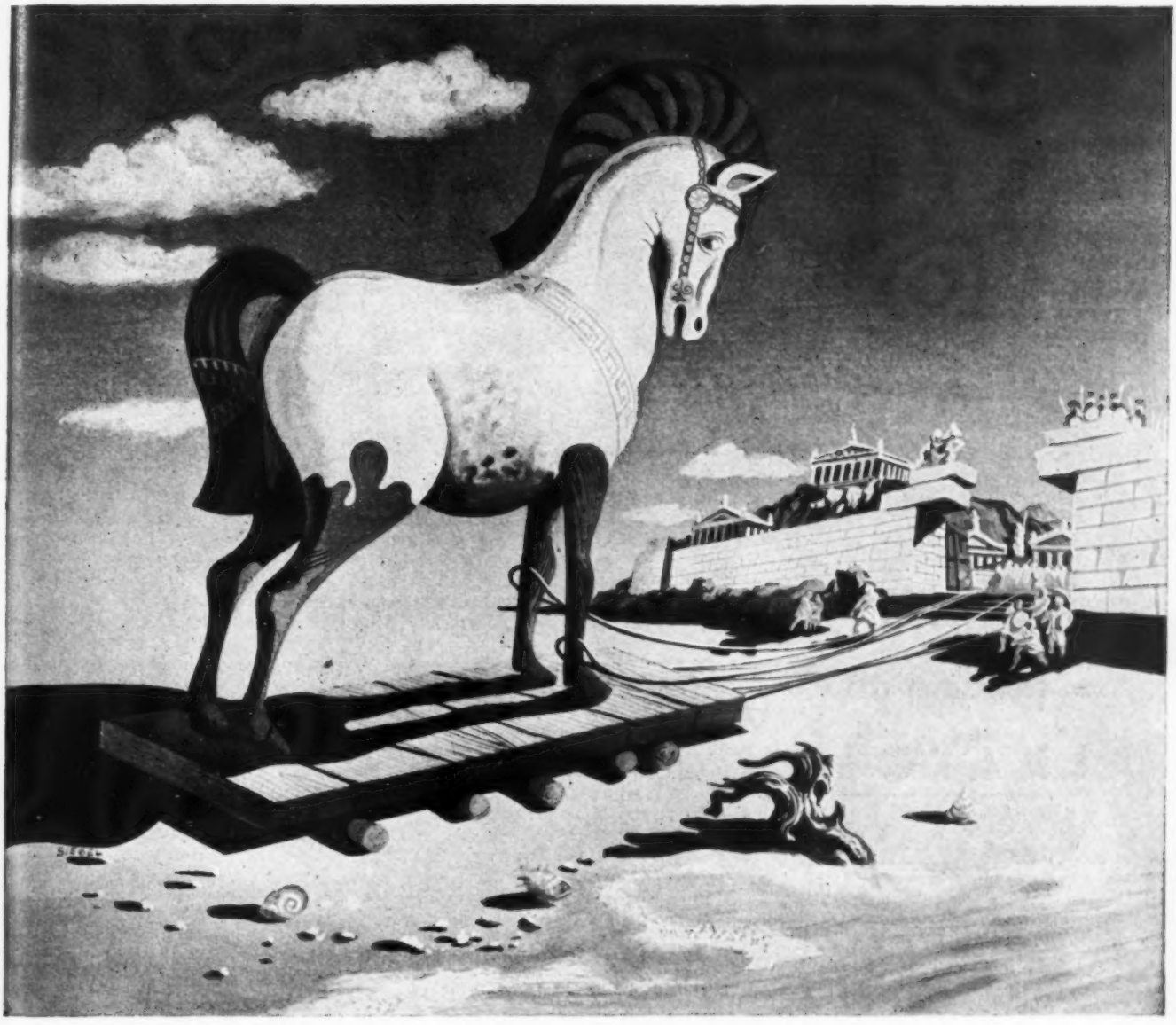
ONE of the most startling medical books of years is "Kaiser Wakes the Doctors." It succeeded in getting its author, Paul De Kruif, in the center of a storm with the American Medical Association. I have no intention of putting myself in the middle of this battle, pro or con, but news is news. After seven months of negotiations, Edward A. Golden who made "Hitler's Children" and "The Master Race," has purchased the De Kruif book and his son, Robert Golden, will produce it in technicolor. The Goldens, father and son, feel they have such a big property in the controversial story they hope to bait such a big catch as Clark Gable for the starring role.

—LOUELLA O. PARSONS, in International News Service—*Fresno Bee*, July 17; *California & Western Medicine*, August, 1944.

Nurses' Unions

THE picture is further complicated by the interest which labor unions have begun to exhibit in nursing. R.N.'s whose fathers, brothers, and husbands have long been union members are beginning to wonder whether their own organizations are as able to represent them collectively as are the aggressively-minded unions. The latter, realizing that the public would never sympathize with a nurses' strike, have attempted, in some cases, to organize the girls on a non-strike basis. Thus far, union efforts have been limited to local areas with industrial nursing the chief objective. Yet the movement shows every indication of gaining momentum and becoming a real threat to the A.N.A.'s national dominion when the war is over. Says one nurse: "It's high time the A.N.A. asked itself, 'What have the unions got that we haven't got?'" Industrial nursing, by the way, has come to the fore more noticeably in recent years than most other branches of the profession. Academically, its standards have improved. Organizationally, it has taken on new strength through the formation of the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES and the creation of an industrial nursing sections in the A.N.A.

—From "What's Ahead in Nursing," by MELVIN SCOTT, in *Medical Economics*, August, 1944.



Therapeutic Trojan Horse . . . Sulfonamides are bacteriostatic; not bactericidal; not self-sterilizing. Thus a contaminated sulfonamide preparation, applied locally, may act as a therapeutic Trojan horse, releasing pathogenic bacteria inside the body's primary defenses.

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INDUSTRIAL HEALTH and DISEASE

Industrial Health

LEVERETT D. BRISTOL, M.D.,
Chairman, Committee on Education, Council on Industrial Health
American Medical Association,
and
CARL M. PETERSON, M.D.,
Secretary, Council on Industrial Health

WAGE earners are numerically and economically the most important single constituent in our population. It follows that industrial health should be the most important element in the public health. The Council on Industrial Health believes that industry, regardless of size, should have certain health services available to it. These are defined as follows:

From *J.A.M.A.*, August 19, 1944.

1. A competent physician who takes genuine interest in applying the principles of preventive medicine and hygiene to employed groups and who is willing to devote regular hours to such service in the working environment.

2. Industrial nurses with proper preparation, acting under the physician's immediate supervision or under standing orders developed by him or by the committee on industrial health of the county medical society.

3. Industrial hygiene service directed at improvement of working environment and control of all unhealthful exposures, to be provided by physicians and others with guidance and assistance from the specialized personnel in state and local bureaus of industrial hygiene.

4. A health program which should include: (*a*) Prompt and dependable first aid, emergency and subsequent medical and surgical care for all industrially induced disability. (*b*) Health conservation of employees through physical supervision and health education. (*c*) Close correlation with family physicians and other community health agencies for early and proper management of non-occupational sickness and injury. (*d*) Good records of all causes of absence from work as a guide to the establishment of preventive measures.

Widespread application of these services, suitably adjusted to community medical and health facilities, would enhance the well-being of millions of workers and contribute greatly to the productive capacity of the country.

If industrial health is to expand and improve according to this general pattern, support must be assured from several influential quarters. The war, by reason of its insatiable demands on industry and industrial manpower, has in fact enlarged our concept of the industrial physician's functions from practical necessity to limitless opportunity. There are signs that support will be continued and augmented in the postwar years from the following sources:

1. The government. Governmental interest is represented by an unbroken trend toward liberalized procedure, greater coverage and increased benefits under workmen's compensation and social security. Each year new sanitary, safety and health codes are developed for enforcement by federal, state and local agencies. Bureaus of industrial hygiene have steadily improved their facilities for investigation of working conditions and for consultation with management and physicians.

2. Management. The successful performance of existing industrial medical departments strongly suggests that an acceptable formula can be developed jointly by industry and medicine which will bring qualified physicians regularly and directly into the work place. Once agreed on, the value of the formula must be demonstrated to industry both small and large. To this educational service the trade associations and manufacturing and commercial groups are already committed. It is only under this kind of organization that individual physicians can bring to individual plants widespread application of the great store of clinical and technical information already available in sufficient quantity to make every occupation a safe and healthful one.

3. Labor. Industrial health is here to stay as a factor in collective bargaining. The appearance of health and safety clauses in employment contracts, its advocacy of health and hospital insurance coverage, participation in case finding surveys and willingness in certain areas to support its own industrial hygiene services are indications of labor's rapidly mounting interest.

4. Medicine. Initiative and guidance in this expanding field must be assumed by the medical profession if high standards of accomplishment and conduct are to prevail. Progress in this direction is being made. Nearly every sizable industrial community has a committee on industrial health in its medical society, all the members of which are prepared to cooperate with other community interests to improve industrial health. The specialty groups likewise are beginning to realize that help from them is essential if many unhealthful and unhygienic problems are to be solved, and that industry also offers unparalleled opportunities for clinical investigation and observation. These activities augment, of course, the services of individual physicians already employed full or part time in industry.

Educational Requirements. — These developments, representative of improved integration between medicine and other affected groups, must be accompanied by improved opportunities for training. It is still largely true, in spite of recent advances, that industrial medicine, hygiene and health administration are commonly taught without real insight into industry's and the workers' needs and their relation to medical and health facilities in the community at large. There is a tendency to resolve the whole problem of medical service in industry by regarding it as general practice in a plant. Most experienced industrial physicians would disagree. Industry's paramount need for the prevention of injury and disease with the resultant details of medical and engineering control over the worker

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and his environment are the factors which distinguish industrial health from conventional medical practice. Much as industrial health owes to every other medical discipline, its real future lies in the domain of preventive medicine and public health. It is in this direction that its essential characteristics as a recognized specialty are likely to occur.

The appointment of a committee representing the Council on Industrial Health and the Council on Medical Education and Hospitals is a step in the direction of orderly definition of the problem and its practical solution. A beginning has already been made. It is hoped that through this means:

1. Every medical graduate will obtain reasonable grounding in the fundamentals of industrial medicine and surgery, industrial hygiene and toxicology, and industrial health administration.

2. Every encouragement will be given to promote introductory, refresher and continuation courses for practicing physicians under sponsorship of medical societies and medical schools.

3. The value of industrial experience during the internship can be investigated.

4. A program of graduate training can be evolved in conformity with existing standards for certification, using the residency and fellowship methods which characterize extended study in other clinical fields.

5. Coordinated training of physicians and engineers for industrial health service can be developed, preferably in schools of public health or institutes of industrial health.

6. Standards for the training and employment of technical assistants can be elaborated.

Medicine has much to offer industry. Its opportunities should not be hampered by lack of imagination or leadership.

The A.M.A. Council on Industrial Health

STANLEY J. SEEGER, M.D.,
Chairman

THIS is the Sixth Annual Congress sponsored by the Council on Industrial Health of the American Medical Association. These conferences represent one phase of the work of the Council. They have served, among other things, to provide a basis for wide appreciation of the enormous scope of industrial health. They have revealed the complex character and the contentious nature of some of the problems in this field. One fact which has emerged is not new to those who devote much time to industrial health problems. Conditions of work and their effect on health in every field of human activity eventually come within the scope of medical study and research. The problems of industrial health are not static. Science gives new knowledge. Medical concepts change and industry also changes, not only in its techniques, but also in its attitudes.

The perfection of methods of treatment and prevention by physicians and hygienists and engineering specialists has, in the past, been followed by a lag in their utilization by practicing physicians who care for a large segment of the industrial population. The difficulties of establishing industrial health programs in small plants characterize the manner in which science has outstripped the advancement of social and professional organizations which would make possible the fullest utilization of our knowledge. This lag has been caused by several factors, one of the most important of which has been the extremely rapid development of industry. Another has been the failure of medical educators to train students, both undergraduates and graduates, in preventive medicine and public health activities and to assign to industrial medicine the place which its importance justifies.

The medical implications in our industrial expansion and the changes in the practice of medicine effected by workmen's compensation laws have not been adequately emphasized by our medical schools. Industrial hygiene has been widely taught as a relatively minor section of preventive medicine. Public health problems of medicine and surgery have been presented without any relation to prevention and control over exposure and only as examples happen to present themselves in clinics or wards. Industrial medical administration has been almost entirely ignored. The experience of a number of medical schools amply demonstrates that reasonable acquaintance with the subject can be provided at modest expense. The all important requirement for improved instruction is a unified plan which assigns over-all responsibility to one single teaching division, preferably preventive medicine and public health.

The interest of the Council in education in industrial health has been expressed by (1) the original report of its committee on scope, (2) the formation of a sub-committee on education, (3) articles on industrial medical education in the special industrial health issues of *J.A.M.A.*, (4) instructions to state and county committees, and (5) development of a syllabus for undergraduate and graduate teaching. The response of medical educators has been encouraging not only to the program of the Council but also to the efforts of the American Association of Industrial Physicians and Surgeons.

On previous occasions I have emphasized the essentially medical character of industrial health activities. At present, when medical and health plans centering about industry and when hospital relationships are matters of such serious concern, this basic principle, the essentially medical nature of health activities, should more than ever be subjected to discussion. Unfortunately, in discussions having to do with industrial health and medical care plans and with hospital organization the talk is around this point but the principle itself is never emphasized, nor is any constructive effort made to apply it. This principle is basic, and it is vital to the problems which are pressing for solution today. We spend much time in discussing medical relationships in hospitals and in analyzing medical features of various hospital plans and their effect on medical practice. Why is the fact not brought out that in the majority of hospitals in America today the medical staffs do not control the medical policies or in many instances know the names of the lay persons who decide the policies of the institutions in which they practice? The serious nature of this widely prevalent situation has not been headlined in the discussions of medicine's present difficulties.

This discussion of hospital problems is not beside the point here. The hospital has been a normal nucleus about which efforts for medical care have revolved. With the acceleration of all human effort during the war, the tremendous industrial expansion, the shifting of population, the limited number of physicians, the difficult problems of housing and sanitation and transportation and nutrition there has come as a matter of course

From "Industrial Health Number," *J.A.M.A.*, May 27, 1944.

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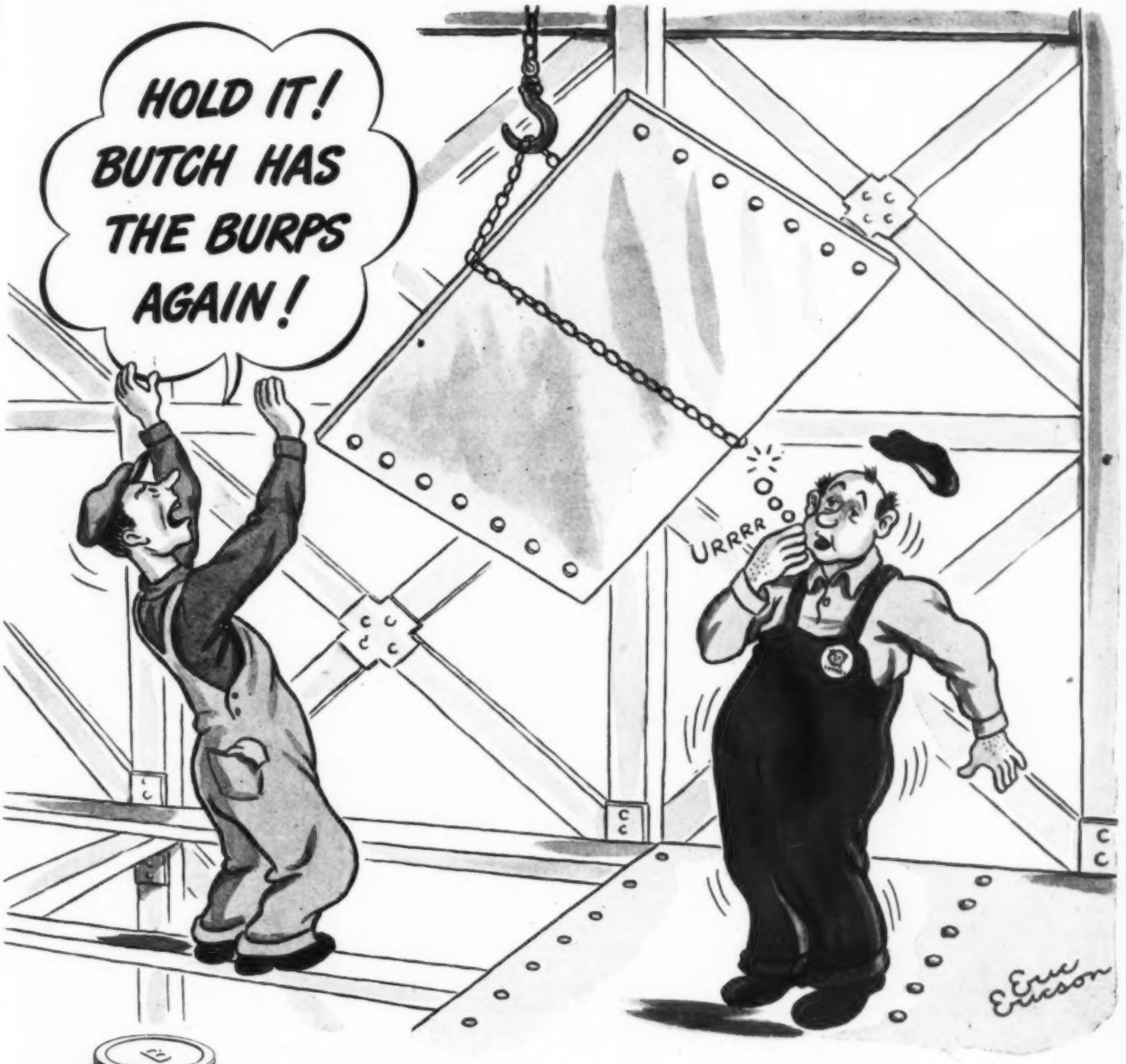

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a great impetus to the study of industrial health programs and of medical care plans. The interest which has been so stimulated has been productive of definite results in many industrial centers, and the development is continuing. In both the hospital and industry the physician is dealing with corporations. In both a third party is interested in certain phases of medical care. In industry the corporation has a legal obligation to assume certain medical responsibilities. In both the hospital and industry we have a growing interest in the expansion of health service on the part of the corporation. In the case of industry this interest is being augmented by labor organizations. In viewing industry we find that, in contrast to the hospital, we are dealing with a tangible organization where names are known and where, in most instances, the directing heads are residents of the communities in which the physician practices. The contacts necessary for the physician to organize health activities exist. It is recognized that other groups, business, labor, insurance, government as well as several non-medical professional skills, have a real interest in the delivery of health service. It is our concern that the physician should be the central figure in the organization which delivers such service. The physician's place in such a program will be dependent on his own leadership, his place in his own community. The problem is essentially a home town problem. While we have perhaps become conditioned to look for master blueprints, we should remember that the minimum requirements for health services in industry have been defined and the principles involved are well known and well understood. The delivery of competent health service in industry demands that the position of the physician in the structure of industrial organization be clearly visualized and that his relationship to other interested skills should be clearly analyzed.

With the increased interest in medical care plans has come a discussion of the desirability of the organization, on a wide scale, of medical groups or clinics. The arguments favoring the extension of group or clinic practice need not be recounted here. The advantages offered by this type of practice are generally conceded, as is the need for making more generally available various diagnostic aids. This does not mean that the general practitioner must disappear or that the specialist should not have a broad knowledge of medicine which will enable him to do a good job at what has been dubbed recently as solo practice. Clinic or group practice has become so popular a phrase and has been so widely recommended, particularly by some industrial leaders, that it would seem a logical step to re-examine the fundamental professional relationships involved and the methods of business organization of clinics under the principles of medical ethics. The professional relationships and business relationships in groups and clinics are generally accepted as ethical and sound, but the basic principles of organization are not too well understood. A critical analysis of this type would be most helpful in clarifying the situation and in determining the desirability of accelerating the development of this type of medical entity on a broader scale.

The activities of the Council during the last year have been increased but have adhered essentially to the lines originally drawn. Since the inception of the Council, its members and others interested in its work have realized the necessity of developing relationships with trade associations, business organizations and other extra-professional groups having a genuine interest in the health of workers. The vital concern of the worker himself has not been overlooked. Working contact with organized labor has not been easy to establish in spite of the obvious importance of the activities of the Council and the Association to various labor groups. It is significant that the likelihood of establishing some satisfactory contact and working arrangement with labor seems brighter now than it has at any time in the past six years. In the work of the Council during the past year, two reports should perhaps receive mention now. The first is the Report on Standing Orders for Nurses, which has been well received. The Council has recognized the important position of the nursing group in industrial health activities and has sponsored efforts to harmonize activities of physicians and industrial nurses.

The Council has also issued a report on Physical Examination in Industry. Physical examination will in all likelihood assume a place of unusual importance in coming months because of the necessity of re-employment of disabled persons. There are evidences that labor itself will restudy and probably reverse its stand in some instances on this important phase of industrial health. The contributions of a scientific nature which have been made by the various councils, bureaus and scientific sections of the American Medical Association are almost limitless, and these resources are at the service of those who are interested in industrial health programs.

This Council has stimulated in the various scientific sections the creation of committees on industrial health, and several have made noteworthy contributions. The activities of some of these special committees are reflected in the present program.

Summary

THE physician should be the central figure in health activities, whether in the field of clinical medicine, public health or preventive medicine.

2. The problems of medical service in this country are being solved in many areas by developments which center about industry and are essentially on a grass roots basis.

3. In a majority of hospitals in America the staff has no control over medical policies. The organization of many hospitals is obscure or so ill defined that medical staff organization cannot contact the lay individuals who control policies.

4. The organization of industry is such that it lends itself to a logical and ethically sound approach to the development of health programs.

5. Because of the widespread interest in this type of practice, the practical application of the principles of medical ethics to the professional and business relationships of medical groups or clinics should be restudied and clarified and defined.

Medical Certification in Industry

—Comment and Opinion on This Increasing Responsibility of the Industrial Physician—

THE doctor has always regarded demands for written statements as burdensome. A Middlesex County fee table of 100 years ago contains, among others, the following items:

For a visit in the village.....	$ .75
For a visit out of the village	1.00
For rising in the night and a visit, the night being considered as beginning at 10 o'clock and ending at sunrise	1.50-2.00
For a letter of advice.....	3.00

Were a corresponding value to be placed on the written statements the doctors of today are required to make most of them would prosper beyond their most optimistic dreams. In addition to reporting births, deaths, accidents and contagious and other diseases that come to their attention, the doctors are more and more called on to express opinions concerning all sorts of controversial situations. They must decide if the student with a "cold" is to be excused from the examination he is not too well prepared to face, if patients are entitled to extra food, fuel, or other rations, if various types of work are or could be prejudicial to the health of certain people, and if other people are completely convalescent and able to return to work or merely wish to extend a period of incapacity into a vacation. The decisions themselves always have to do with individuals, and on this account alone the circumstances are never twice alike. The manner in which the profession is

New England J. Med., August 3, 1944.

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meeting these responsibilities has recently been causing some concern. It is a department of professional activity in which character and integrity count, as they so often do, more than skill and knowledge, and it is also a department in which the profession is closely watched by those who would encroach upon it from without. A letter from an industrial physician appears in the correspondence column of this issue of the *Journal*. This doctor is looking on both sides of the problem of medical certificates, and is suggesting that those who have to do with such certificates do likewise. The War Participation Committee of the Massachusetts Medical Society has recently had its attention called to the matter, and has prepared a blank form to cover medical certification for those seeking new employment in essential industries; a statement by the committee and a copy of the blank also appear in this issue of the *Journal*. The prestige of the medical profession is therefore being widely invoked in areas that not only have a direct bearing on its own reputation and future but that are now concerned with the survival of democracy itself. The doctor has traditionally been called on to be an advocate of his patient. It has usually been the individual who has employed and paid him, and he has instinctively defended the patient against impersonal groups whose interests have been more highly socialized. Although the dignity of the individual is one of the tenets of democracy, such groups as insurance companies, benevolent societies and uncoerced industrial interests and enterprises are equally essential elements of our national structure, and they, too, have claims on medical science and opinion. Not all persons are above raising unfair and unjustified controversies between themselves and these impersonal groups, and many of them are clever enough to exploit the physician's instinctive desire to please his clients. Any question of illness or health that is raised becomes a crucial issue, and the doctor is called on to express his opinion, which if it is accepted becomes one of the determining factors in the outcome. If the doctor's judgment in these matters is favorably made and wise, the usefulness and reputation of the profession will be greatly enhanced. If, on the other hand, judgments are carelessly expressed, they may well become a means by which the profession can be undermined. —EDITORIAL.

War Participation Committee

THE accompanying certificate form (Fig. 1) has been adopted by the War Manpower Commission as the standard certificate for physicians to use when recommending change of employment for patients whose condition is or may be aggravated by continuance in their present jobs. The War Participation Committee has assisted in making this form as brief as possible in order to save physicians' time and to give the necessary information to the War Manpower Commission.

WORKER | Last Name | First | Middle | Address | Social Security Account No.

UNITED STATES EMPLOYMENT SERVICE
of the
WAR MANPOWER COMMISSION
MEDICAL CERTIFICATE

1. How long have you been treating the worker named above?_____

2. Diagnosis?_____

3. Would continuance of his present job be injurious to the worker? ☐ Yes ☐ No

(a) If "yes," why?_____

4. What sort of work will his condition permit?_____

Form Date_____ Signature_____
(Attending Physician)

This certificate approved by the War Participation Committee of the Massachusetts Medical Society. It is subject to review by that committee.

Fig. 1.

The War Manpower Commission is of the opinion that physicians have been too easily prevailed on to issue certificates for change of employment. It is urged that physicians issuing these certificates exercise considerable care and discretion to make sure continuance in the present job is harmful to the patient.

The War Participation Committee has agreed to review these doctors' certificates, much in the same way that Dr. Garland's committee reviews physicians' applications for extra rations from the various ration boards.

In summary, the War Participation Committee has agreed to assist the War Manpower Commission and to cooperate with it fully. The War Manpower Commission understands that our committee is interested in seeing that physicians are fairly and courteously treated by the district offices of the Commission. In other words, we stand ready to try to adjust any complaints physicians have against the War Manpower Commission or its branches, as well as to review the certificates sent to the Commission.

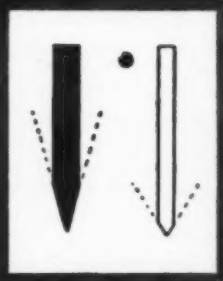
—GUY L. RICHARDSON, Chairman.

TO THE EDITOR: Not the least of the time-consuming chores given to the physician in modern society is that of certifying to this or that concerning his patients. Because of the physician's role among his fellowmen, he emerged early in our social development as the logical one to certify birth, to certify insanity and to certify the occurrence of contagious disease. With increased emphasis on public-health measures the physician has the task of examining food handlers and candidates for marriage for the purpose of certifying that these are ostensibly free of certain specific infections. The physician is deemed to be the logical citizen, in a democratic way of life, to perform these necessary functions.

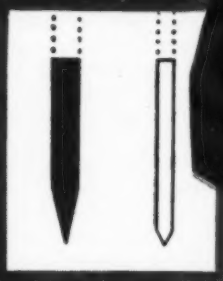
With the rapid growth of the insurance principle during recent years, there has been an increase in the need for medical certification. Health and accident policies depend to an appreciable extent, it would seem, on the knowledge and integrity of practicing physicians for actuarial soundness and for fairness in the disbursement of funds. Industrial organizations have used the insurance principle to provide various benefits for employees. Compensation status require medical judgments as bases to support legal judgments. It has been necessary to use the doctor's statement in an equitable enforcement of rationing while the nation is at war. As one contemplates the intricacies of modern society it is apparent that the end is not yet!

It is doubtful that the physician could or should avoid his function in verifying the existence and character of illness for legitimate ends. There is reason to believe that he should, in some instances, insist on more adequate compensation for the time spent in preparing factually accurate certificates. There is likewise reason to believe that some certificates could be shortened or modified without loss of pertinent information. To avoid them altogether does not seem possible.

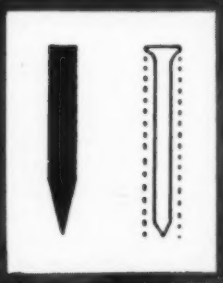
While the nation is at war and struggling to use its manpower with maximum effectiveness, the need to limit absenteeism in industry has focused attention on the character of medical certificates. (Babey, A. M.: Absenteeism, *J.A.M.A.* *122*:395, 1943.) The certificate should be a reliable guide in releasing prompt financial assistance for the ill worker. An instance has been reported (Current



1. SHARPER CUTTING EDGE



2. MORE RIGID IN SERVICE



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SURGICAL BLADES AND HANDLES

Comment. *J.A.M.A.* *122*:812, 1943) wherein a physician "issued a certificate to the effect that a worker was sick with gastroenteritis and was unable to work for a period of six days in the month of May, whereas investigation developed the fact that the person who submitted the certificate actually was working in another establishment and was attempting to obtain pay from two sources by requesting sick leave with pay from one of them."

From personal experience, a request for disability was recently honored on the basis of a physician's certificate stating that the worker was unable to perform even light work at the plant. The worker accepted his disability payments and spent several weeks pushing a wheelbarrow filled with rocks to landscape his residence property! It is true that the family physician risks an irate patient if the physician objects to signing whatever statement the patient requests. On the other hand, one may ask what degree of confidence and respect will the patient have in his doctor if the latter, unwittingly or not, falls in with such connivance?

There is a pitfall in another direction. In view of the marked emphasis given by industry and its advisers to matters of industrial hygiene, the worker with any complaint is likely to blame his working environment. He has had his attention called to this possibility, and it is altogether reasonable that wishful thinking will lead him to indict fumes, gases, vapors, dusts and the like. Actually many unskilled workers have no idea what, if any, exposure they have at their jobs. Such a worker in the role of patient may influence his family doctor to certify to a most astounding and untenable diagnosis. It would seem well to urge that physicians protect themselves against these pitfalls by using confirmatory sources of information. The plant and the plant physician are sources for checking facts. Other sources are the state and federal divisions of industrial hygiene. The exceptionally complete library on industrial health and hazards of the Division of Occupational Hygiene, Department of Labor and Industries, 23 Joy Street, Boston, is available to New England physicians.

Much medical certification is done well. These comments are made not in a spirit of censure but rather by way of directing attention to a potential danger to the good name of the profession. If we must sign certificates, may they invariably be as unbiased and factual as is humanly possible. Our jobs must be scientifically done. Industry depends on the physician for an answer to medical problems. Regardless of their difficulty there is no one who is better qualified to get the answers than is the physician. Therefore it is essential that the approach to these matters should be sound and of the highest ethical quality, so that traditions that have cast so much luster on medicine in the past shall continue to flourish in the future.

—LEMUEL C. MCGEE, M.D., Medical Director, Hercules Powder Company.

CURRENT ARTICLES of QUALITY

—Continued from page 62.

killed from 18 to seven, and the costs were cut from $376,000 to $173,000. An interesting reduction of 24% was brought about in the Indian Service through, for instance, the training program to make Indians safer drivers. The Navy Department has been on the job, too. For example, the frequency rate fell 50% at the Portsmouth Navy Yard from 11.44 in 1942 to 5.72 in 1943. At the Naval Torpedo Station at Alexandria, Virginia, the low rate of 4.92 was further cut to 2.07. Now let us take a few of the best 1943 figures from private corporations:

Name of Corporation	Frequency Rate
Dupont	1.9
U. S. Steel	3.2
U. S. Rubber	3.3
General Motors	4.3

"Certainly these records show what can be done. When you find an accident rate less than one-half of the National Safety Council average, you can figure there has been an effective safety program and that management is on the job. The records of these companies in 1943 were made in hazardous activities with greatly expanded operations, green workers, and unprecedented pressure for high production. If Dupont, maker of explosives, can achieve a safety record six times as good as the government's average, certainly we have a long way to go. Think of this: nearly 5,160,000 man days of productive work—the full-time of 17,000 workers —would have been saved last year, if the government as a whole had had as good a rate as the Alexandria Naval Torpedo Station."

Battle Casualties

MAJOR F. O. BENNETT, N.Z.M.C., and MAJOR P. C. BRUNETTE, N.Z.M.C., "Battle Casualties in the South Pacific," in *New Zealand Med. J.*, February, 1944 (43:233, 4-8). Extracts: *"Casualties from Jungle Warfare.* . . . The operating theatre is an I.P.P. tent with a coral floor and sides attached so that it can be blacked out during a bombing raid. An operating table fits between the tent poles and round the sides are various shelves made of rustic saplings or undressed timber. Batteries in a corner provide the lights which are suspended over the table. Dressings and guards are sterilized in two small autoclaves which are heated over primus burners. The anesthetist is provided with a table of the summer house type and at times is able to procure the ration box to which he is entitled in lieu of a stool. The theatre opens into two other tents, one of which serves as a store room and the other as a sterilizing room. This in turn opens into the resuscitation tent, which is similar to the theatre except that it is fitted with stretchers and stands for blood and plasma transfusions. The conditions are admittedly rough but although this increases the difficulties of surgery it neither limits its scope nor its efficiency. One difficulty is sweating. Sweat literally pours from all the occupants of the theatre and it is difficult for a surgeon to bend over a wound without contaminating it. The anesthetic is usually ether (Squibb's) following an induction by either ethyl chloride or a mixture. The difficulty in hot climates of preventing the too rapid evaporation of ether does not prevail here on account of the excessive humidity. Very frequently pentothal sodium is given, up to 40 cc., and is invariably satisfactory. In all the cases so far there have been no anesthetic worries. Surgical treatment again is as simple as the nature of the case will allow. Debridement and sulphanilamide powder are the essentials. Wounds are not closed. Foreign bodies are removed only if easily accessible. Fractures are usually put up in plaster or Cramer wire. There is of course no x-ray. At times an amputation is necessary, as is laparatomy for an internal hemorrhage or a perforation of the bowel. The majority of the wounds are in the limbs, which is a direct result of the type of warfare. The soldier fights while lying on his abdomen or sheltering behind the root of a tree or peering out of a foxhole. His chest and abdomen are therefore fairly well protected. Jungle warfare has truly been called 'The war of the crouching man.' A very broad generalization is that head wounds are fatal, chest and abdomen wounds do not occur and limb wounds recover. The majority of fatal cases are the head wounds. Almost as many men were killed as wounded. Of the battle casualties that arrived at the M.D.S. (where the Field Hospital is situated) only one New Zealander has died. No cases of tetanus have been seen. Antitetanic serum is in very short supply, and when not available tetanus toxoid (1 c.c.) is given instead. Gas gangrene occurs not infrequently in neglected wounds and is treated by wide excision and heavy doses of sulphadiazine. Of all cases treated from all sources only one man has died with gas gangrene and in this instance the infection was secondary to multiple wounds from bomb splinters. No instance has occurred where a battle casualty has lit up a malarial infection except where the man had ceased to take his daily dose of suppressive drug. The vigor of the wounded as they arrive is always a

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CARBOHYDRATE	30.0 Gm.	62.43 Gm.	VITAMIN D	405 I.U.	480 I.U.
FAT	2.8 Gm.	29.34 Gm.	THIAMINE	.9 mg.	1.296 mg.
CALCIUM	.25 Gm.	1.104 Gm.	RIBOFLAVIN	.25 mg.	1.278 mg.
PHOSPHORUS	.25 Gm.	.903 Gm.	NIACIN	3.0 mg.	5.0 mg.
IRON	10.5 mg.	11.94 mg.	COPPER	.5 mg.	.5 mg.

*Each serving made with 8 oz. of milk; based on average reported values for milk.

matter of surprise. They are filthy, unshaven, possibly starved and with flies crawling over their bloodstained dressings. Despite this they frequently walk or hop to the ward, stand any amount of handling, take an active share in looking after themselves, rarely complain of pain, and make a rapid recovery. . . . . *Bomb Casualties* . . . . On receipt of a warning message one medical officer proceeded immediately to the scene to organize the despatch of casualties. All personnel of the M.D.S. hastily completed preparations for the reception of an unknown number of wounded. Before long these began to arrive, by truck, ambulance and jeep. Each vehicle was boarded immediately by the admitting officer, who, after a brief examination, directed the stretcher-bearers accordingly. Many were sent off immediately to the resuscitation ward, a few to the theatre, seriously wounded to the wards reserved for them, less seriously wounded to other wards, a few to the morgue. The injuries were nearly all gross and along with a major wound there were frequently minor ones. Illustrative examples were: buttocks blown away, traumatic amputations of arm or of leg, pneumothorax, perforation of the abdomen and diaphragm, fracture dislocation of spine, gaping wound on the shoulder joint, laceration of the abdominal wall. The majority had some form of compound fracture and all had ugly flesh wounds, often multiple. The first urgency of course was to treat shock and the resuscitation officer had his plasma flowing within five minutes of the receipt of his first case. Whole blood, saline, and glucose are administered by Abbott's apparatus, which is found to be eminently satisfactory. The resuscitation tent is equipped for three cases only. As a result before long the wards were transformed into resuscitation wards and all spare medical officers were soon engaged on this work. Orderlies administered drinks and morphia. An inevitable delay occurred in a few collapsed cases where it was necessary to cut down on veins. In the meanwhile the theatre was dealing with the more urgent cases. A number of transfusions were given in the wards, any passing orderly who was Group O being selected as donor. The work was distinctly unpleasant. Many casualties arrived stripped of all clothing and covered with filth, sweat and blood. The wards were soon contaminated with mud, blood, dirty dressings, damaged equipment and clothing and plagues of flies. A certain degree of urgency attached even to the work in the morgue. Rigor mortis was established 45 minutes after death. All corpses had to be sewn up immediately in blankets on account of ants and vermin. Many of the dead were not wearing identity discs and this added to the difficulties. Fortunately the casualties arrived in the daylight, otherwise a tragedy could easily have been turned into a disaster. As the afternoon wore on the wounded became classified in the minds of the officers as of three types —those who would die, those who would survive, and those who might do either. The first two classes were handled almost exclusively by orderlies, and more detailed treatment could be given to the last group. By this time two theatre teams were working. The heat and the sweating added to the difficulties and also the continual arrival of new cases."

Nursing Practices in Industry

OLIVE M. WHITLOCK, Associate Public Health Nursing Consultant, VICTORIA M. TRASKO, Assistant Statistician, and F. RUTH KAHL, Public Health Nursing Consultant, "Nursing Practices in Industry," from the Industrial Hygiene Division, Bureau of State Services, USPHS, in Public Health Bulletin No. 283 (for sale at five cents per copy by Superintendent of Documents, U. S. Government Printing Office, Washington, 25, D. C. Summary: "A discussion of current nursing practices in industry has been presented. It included a brief review of the events leading to and effecting the industrial nursing survey; factual information on the extent of nursing participation in plant health, safety, and welfare programs; a review of the factors influencing the character and extent of nurses' activities; a review of problems in industrial nursing implied in this study, and the recommendations of the advisory group for acceptable practices. The findings presented are based on the analysis of data secured through a nation-wide survey of duties of nurses in industry conducted during March to December 1942, in 36 States and the District of Columbia. The survey was a joint activity of the Committee to Study the Duties of Nurses in Industry, appointed in 1940 by the Public Health Nursing Section of the American Public Health Association, and of the Division of Industrial Hygiene of the National Institute of Health, U. S. Public Health Service. The purpose of the survey was to obtain factual information on the activities of industrial nurses which was to serve as a basis for determining the range of nurses' activities, for defining current problems in industrial nursing, and for formulating standards of good practice in industrial nursing. Recommendations on desirable nursing practices in industry, based on the preliminary findings of the survey, were drawn up early in 1943 by the advisory group composed entirely of industrial nurses. The survey covered the activities of 3,027 full-time graduate registered nurses in 868 establishments employing some 2,400,000 workers. It also included 22 plants with part-time nursing services and 34 plants in which the services were carried on by non-professional workers. Eighty-nine per cent of the 3,027 nurses were employed in manufacturing industries and 11% in non-manufacturing industries. The establishments varied widely in size, with the group employing from 500 to 2,499 workers leading in the number of establishments surveyed, but the size group employing 10,000 and more workers accounted for the greatest number of nurses. The range of activities of nurses was found to be extensive. The extent to which nurses participated in specific health and safety activities was discussed in relation to the amount of medical direction prevailing in the plants. The types of activities and the proportions of the 868 establishments surveyed in which nurses carried on some part of these activities were found to be as follows: (1) The primary function of practically all industrial nurses was nursing treatment and care of occupational injuries and illnesses and emergency care of non-occupational illnesses. (2) In all plants nurses performed routine duties concerned with the organization and maintenance of the medical department. This included the care of the dispensary, the purchase and preparation of supplies, the keeping of certain records, and at times, the preparation of reports. (3) In 50% of the plants nurses participated in the medical examination program by giving assistance with physical examinations, laboratory, x-ray, and other technical services. (4) In 15% of the plants nurses participated in the health education program by carrying on activities such as counseling workers and groups, follow-up of remediable defects, teaching home nursing classes, and distributing health literature. (5) In 42% of the plants nurses assisted with accident control and safety education programs, including plant accident investigations, serving on safety committees, teaching first aid classes, and the care or distribution of personal protective equipment. (6) In 39% of the plants nurses assisted with environmental sanitation and inspected ventilation, lighting, housekeeping facilities and sanitary facilities for women in the plant. (7) In 75% of the plants nurses participated in the plant welfare program, chiefly through advice to workers on personal or family problems. In some instances, nurses assisted with the management and inspection of cafeterias, with recreation activities, credit unions, and sick benefits. (8) In 25% of the plants nurses made home calls to workers or their families. In addition, in 14% of the plants nurses reported carrying on activities outside the medical department, such as stenographic and other clerical work, fingerprinting and photographing, and relieving at the switchboard or in the canteen. It was found that practically every nurse had certain duties concerned with records of treatments, but the preparation of periodic reports of their activities was required in only 65% of the estab-

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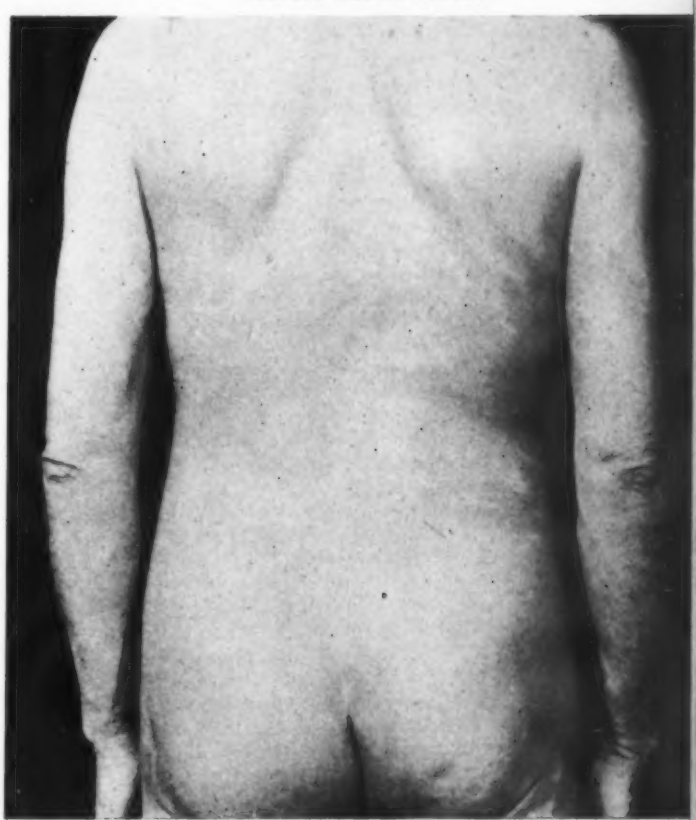

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lishments. An analysis of 115 monthly reports which were collected showed that these reports varied widely in content and form, and that relatively few items were considered important to management consistently. This analysis also gave rise to the question of whether management and nurses considered the value of reports and whether they gave any thought to the objective to be attained through the use of the reports. A study was made of the factors influencing the character and extent of nurses' activities. Although much of the variation found was attributable to the nature and diverse needs of industry, to provision for certain services, and to plant policies, there were other influencing factors. Of the four factors whose relative influence on the extent of nurses' activities was measured statistically, the amount of medical direction and the size of establishment showed greater influence than did the type of industry and date of establishment of nursing services. Of the activities tabulated against these factors, trends were observed for assistance with physical examinations and technical services and with safety and sanitation activities, whereas comparatively little change was observed for health education activities and for home nursing service. The four tables which were prepared as the basis for this discussion also showed the results of combining these activities with one another. Other factors which influence the character rather than the extent of nurses' activities were also discussed. Written standing orders or procedures, which serve to protect the nurse against criticism or legal action for possible violation of the nurse practice acts, were provided in 36% of the establishments surveyed. A study of the qualifications for professional training of these nurses showed that 13% completed one or more courses in a college or university, and 1.2% had completed special courses in industrial nursing. There was a definite tendency for nurses to affiliate with professional organizations. While 48% of the plants employing two or more nurses were reported to have nursing supervisors, the survey findings indicated that the amount of nursing guidance in general was limited. Other influences were administrative responsibility for nurses' activities, the employment of non-professional attendants in these plants, and the unit of workers served per nurse. With respect to the unit of workers, 33% of the establishments met the requirements set forth in the recommendations of the advisory group. By limiting the computation to plants employing nurses only, it was found that the average number of workers employed per nurse in the surveyed industries varied from 603 to 862 workers. The activities of graduate registered nurses serving on a part-time basis in industry and the activities of non-professional nursing personnel were also briefly reviewed. This review disclosed that the range of activities carried on in both types of nursing services was as broad as that of full-time nurses. However, limitations in the character, as well as in the extent of participation in plant health services, were noted in the activities of the non-professional nursing personnel. As a result of the analysis, certain problems and needs in industrial nursing became evident. These included standards in nursing practices, professional preparation of industrial nurses for their duties, written standing orders, nursing supervision, the use of records and reports, the practice of using nurses for non-nursing duties, and the use of non-professional attendants in industry. The lack of standards in nursing practices in industry and the lack of standing orders should no longer be major problems in industrial nursing. Recommendations for acceptable practices in industrial nursing were prepared by the advisory group of the Committee to Study the Duties of Nurses in Industry, while an outline of suggested standing orders for industrial nurses was prepared by the Council on Industrial Health of the A.M.A."

Wartime Measures

GAYLORD R. HESS, M.D., Chicago, Division of Medical Service in Industry, A.C.S., "Influences of War on Medical Services in Industry," in the *Bulletin of the American College of Surgeons, War Issue,* June, 1944 (29:2, 177-183). Extract: "It has been observed that, in many instances, the nursing staff members record the medical histories in connection with the pre-placement physical examination. They take and record the weight, height, pulse, temperature, vision, hearing, blood pressure, do the urinalysis, and take blood for Wassermann tests; and in some cases they are qualified to do other laboratory and x-ray work. This alone conserves much of a physician's time. Some plants, previously having employed full time physicians, have been obliged to accept part time service, while others, having had part time doctor service, are now operating only on a call basis. Early in the war, there were some plants which, when they visualized the drain on physicians, had the foresight to begin to build their bridges to meet this contingency. Scouting about in their own and even more remote communities, many were successful in obtaining the services of physicians past middle age and who they knew would most likely be exempt from military service. They were engaged on part or full time. The doctors even though retained in industry, due to vast industrial expansion, have had to devise ways and means by which they could approach the task of meeting the essential demands. The pre-placement physical examination routine in many instances has been cut down to only a shadow of its original form. In some instances, though almost hard to believe, pre-placement physical examinations in some large plants never did exist nor do they yet; in others, the practice has virtually become at least temporarily extinct, except for observations made and recorded by nurses or other lay personnel. In many instances, routine urinalyses, blood pressures, and blood tests have been omitted. To conserve writing time, check marks, zero marks, or positive signs or other code markings have been adopted. Some only record positive findings, not even checking the negatives. Some companies allow an applicant to work two weeks or more without a physical examination to allow for the possibility of his being a "floater." Some companies allow absentees to return to work with no re-examination, although some may require a written statement from their attending physician in certain cases. There are a number of legitimate ways by which the plant physician can be relieved as to his time, his work and of fatigue. An adequate, well arranged, and properly equipped industrial dispensary sets the stage for the theater of action. One may imagine the number of applicants who could be examined in a day where the facilities accommodate only one preparation at a time. In this type of plant, the boss is quite likely to come in and announce that a hundred new men will be in tomorrow morning for their examinations, expecting them to go to work in the afternoon. A physician's office should be as nearly centralized in the dispensary about which the greatest activity takes place. This has particular reference to emergency work and physical examinations. If these quarters are widely separated, much time is consumed in covering ground. Already prepared sterile emergency dressing and suture material, gloves, syringes and needles, and frequently used instruments could be packaged and kept available for immediate use. During a physical examination, the applicant could begin reading the eye chart several lines down from the top instead of starting with the large letters at the top. During the physical examination, the physician could dictate his findings to a nurse or some trained clerk. Previous mention has been made regarding short cuts in pre-placement physical examinations. The advisability of any universal adoption of some of these practices is highly questionable. Resorting to skimpy, superficial, unreliable and unscientific procedures defeats the whole purpose of one phase of an industrial health program, for the object of a physical examination is: (1) to facilitate the latest scientific concepts of proper placement; and (2) to acquaint the examinee with his physical status in order to assist him in improving and maintaining his health. None other than a physician is qualified to impart this information."

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Problems

FREDERICK W. SLOBE, M.D., F.A.C.S., President, AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, "Medical Service in Industry During War," presented at the War Sessions, A.C.S., Des Moines, Iowa, March 4, and Chicago, March 6; published in the *Bulletin of the American College of Surgeons War Issue*, June, 1944 (29:2, 185-190). Extract: "In reviewing these many problems of medical practice in industry, it is obvious that many of them are general and reach far beyond the confines of the plant. That is why every physician is part of the industrial health program, irrespective of whether or not he has any direct connection with industry. The work of the full time or part time physician in industry must be integrated with that of physicians in general and private practice. For example, an employee consults his private physician because of some obscure ailment. This physician may request that he be transferred to another department, or that the employee be changed from the night shift to the day shift; or he may state that some chemical is at fault, or perhaps that the employee has suffered a strain or other injury. Before the physician arrives at such decisions, a telephone conversation with the plant physician may iron out the difficulty. Many employees attempt to quit one job for another with higher pay. If the job is 'frozen,' they require a doctor's certificate to effect a transfer. Physicians should be on their guard lest they unwittingly become an accomplice to such evasive tactics. Again, since most absenteeism is due to illness, the physician in private practice has an important obligation to make sure that such absences are not prolonged beyond the safe requirements. Foulger has stated that the first evidence of chronic exposure to toxic chemicals is a disturbed physiology, one of the earliest indication being a gradual rise in the diastolic blood pressure. While this should be spotted by a well organized medical department, in the case of most of the small plants it may be the private physician who first has the opportunity to observe this change. Hence, the need for correlation with the general medical profession, local health departments, state industrial hygiene bureaus, county industrial medical committees, and government agencies. A problem which has always been with us but which now assumes even greater significance concerns the attitude of industry itself. In the past, it has almost been incumbent on the doctor not only to meet the demand for industrial medical service but virtually to create such demand as well. As expressed by Heiser, a 'catalyst' was needed to bring the plant executive and the physician together. Now, the war has forcibly created the demand. Physicians with or without plant connections can help in the educational program by explaining to their corporation executive friends that an industrial health program is 'good business,' as has been amply demonstrated by the survey of the National Association of Manufacturers in 1941. The value of the extra time spent by physicians in an industrial health program should be recognized and adequately remunerated. It is separate from the care of the injured and the usual physical examinations which are on a unit charge basis, and it should not be expected to be 'thrown in' gratis as a part of the latter. It merits recognition as an essential phase of a plant's activities and requires adequate remuneration. Likewise, the attitude of the employee and of employees' labor organizations definitely affects medical service in industry. This program is for the employee. He, therefore, has an obligation to help, for by doing so he helps himself as well as the cause. Health education, safety measures, and advice as to good habits are largely nullified unless they reach a receptive mind. Physician can do much to impress the workers and their organization leaders with the important role that they have in helping solve the many problems that exist today in connection with industrial and community welfare. Regardless of how busy they are or how affected by problems of professional personnel, the vast majority of physicians have welcomed the opportunity of closer contact with the small plants, which employ about 80% of the nation's industrial workers. Essentially, medical service in industry during the war has the same problems that existed prior to the war, except for the diminished personnel to meet requirements, the intensification of previously known factors and effects, and the present necessity for conserving man power for war production. It took a war to bring the public and the medical profession to a realization of the importance of medical service in industry. Let us hope that this gain will be held and even augmented in the peace to follow."

Good Practice

ROBERT A. KEHOE, M.D., Cincinnati, Research Professor of Physiology, University of Cincinnati College of Medicine, and Director, Kettering Laboratory of Applied Physiology, "Medical Service in Industry," presented at the War Session, A.C.S., Cincinnati, March 8; published in the *Bulletin of the American College of Surgeons, War Issue*, June, 1944 (29:2, 190-195). Extract: "The daily work of the industrial physician is made up of medical examinations, care of the injured, inspection of plant facilities, maintenance of records, preparation of factual and advisory reports, consultation with colleagues in and out of a plant, and, last but not least, correspondence or consultation with the several agencies, governmental and otherwise, that are concerned with one aspect or another of the inefficiencies, illnesses, or disabilities of industrial workers in shop or office. For functional purposes, examinations may be classified into those carried out before employment (commonly spoken of as pre-placement examinations), those carried out at more or less regular intervals for checking general health (often called periodic examinations), and those carried out in connection with changes in the status of workmen, i.e., at the time of a change of work or cessation of employment, on the occurrence of injury or illness, and prior to reinstatement in employment following illness. A certain pride has tinctured descriptions of "stream lined" types of pre-employment examinations that have been carried out in some of the larger war time plants. As much as possible of the work is done by nurses, attendants, and technicians. In many instances a doctor spends but a few minutes with each person. Various specialized examinations are completed in record time, and the mill grinds out examinations at a rate comparable only to that of the production line. Pride in the efficiency of the process may be justified, and medical thought and procedure can properly be congratulated upon its adaptability to the necessities of a situation. Let us not deceive ourselves, however, in the belief that this is good industrial medical practice as judged by any normal standard. The sights are set low for certain good and even urgent purposes; men and women are sorted out on the basis of a limited number of obviously important types of physical defects, and some, at least, of the major risks of life and limb are thereby reduced. Placement in the most suitable job is not possible, however, and the purpose of promoting the best health and well being of individuals and of the plant population as a whole must be reduced to the low negative level of avoiding the worst consequences of complete disregard of preventive medicine. Is this the function that this phase of industrial medical practice is destined to fulfill? If it is not, industrial physicians should clarify their position in their own minds and in that of industrial management. The question of proper professional procedure arises not only in connection with pre-placement examinations, for these are referred to only by way of example. The entire program of medical and nursing practice in industry may well be scrutinized from time to time, not for the purpose of maintaining a slavish adherence to a traditional pattern, but rather to the end of fitting the medical service to the changing needs of industrial hygiene. In doing this there must not be forgotten for a moment the absolute necessity of maintaining relationships of mutual respect and good faith between a doctor and those who are under his care. Moreover, no substitute has yet been found for

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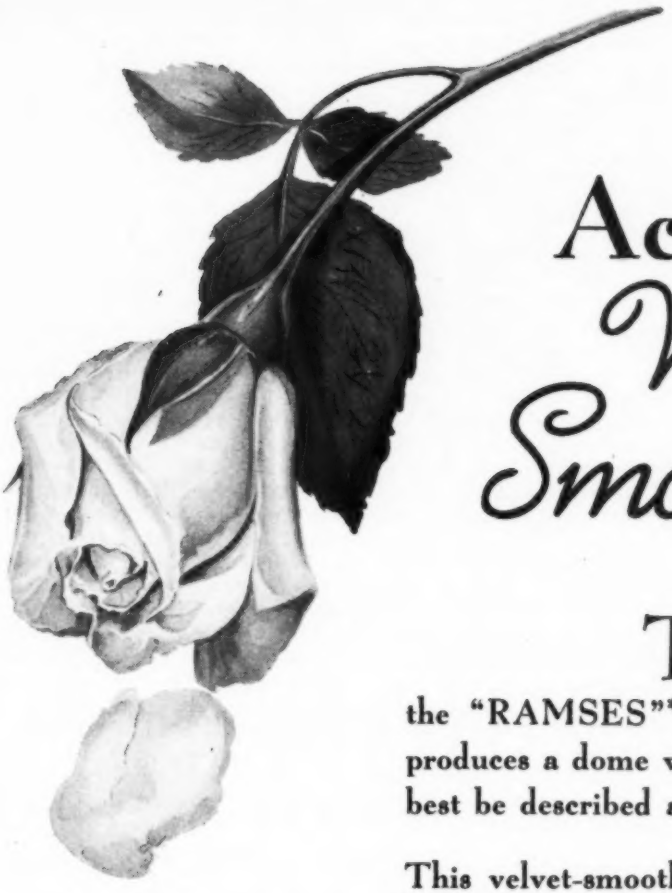
the careful study of the individual person in arriving at a medical conclusion, whether the latter is concerned with the nature of a mental or physical illness, the suitability of a specific job for a specific man, or the accumulation of information on groups of persons for the appraisal of general hygienic conditions. *Medical Supervision of Industrial Plants and Processes.* The industrial physician, whether plant physician or private consultant, must be familiar with the occupational conditions under which his patients or the men under his care are employed. Only in this way can he avoid serious mistakes of omission and commission. A passing reference was made above to the inspection of a plant process by the physician. This reference was not made unintentionally nor out of naive failure to recognize that this is commonly believed to be the province of an engineer trained in matters of safety or industrial hygiene. The fact is that the only way the physician can know the facts about plant conditions is to observe these conditions frequently and to study them carefully. Moreover, the only manner in which he can project medical and physiologic considerations into operating procedures and engineering plans is to take part in the formulation of such procedures and plans. It is obvious in the present period that the doctor in industry may have so many routine clinical jobs to perform that he must leave the study and control of environmental conditions to engineers. There is an inherent danger in this situation in that it may result in an accepted division of responsibility whereby only the engineer deals with environmental problems while the doctor concerns himself only with personnel. This must not be allowed to happen. It can be avoided only if the physician in industry accepts his responsibilities for joining with the engineer in the study of the plant environment. The measures of control are admittedly engineering problems in large part, but the test of their adequacy is a medical matter, while the co-ordination of procedures of mechanical control with proper medical management of the personnel is usually advantageous and often imperative."

In Canada

DR. J. C. CUNNINGHAM, Toronto, Director, Division of Industrial Hygiene, Ontario Department of Health, "Medical Service in Industry," presented at the War Sessions A.C.S., Winnipeg, February 28, and Montreal, March 17; published in the *Bulletin of the American College of Surgeons, War Issue,* June, 1944 (29:2, 183-185). Extract: "A survey of manufacturing industry in Canada at the beginning of 1943 showed that there were 110 full time and 225 part-time physicians in industry; and about 75% of them were conducting some degree of general health supervision, and the remainder were engaged in the treatment of sickness as it arose. There were about 900 nurses in industry. In Canada as well as in the United States about one-third of the employees engaged in manufacture were receiving some type of physical examination. At present large numbers of employees do not receive the benefits of general health supervision, and in those industries with a health program, marked variations exist in its scope and in the personnel available to carry it out. The medical associations in Great Britain, in the United States, and in Canada, have set out in some detail what this program should be. It may be considered under seven headings: (1) *Physical Examination for Placement at Work.* It is important that the information obtained in such examinations be used to assist the employee to find suitable work so that he may not be called upon to make all the adjustment, and that the examination would not be used for rejection except in rare instances. (2) *Periodic Physical Examination.* The interval between these examinations should be determined by the advent of intercurrent sickness or accident, the findings at the previous examination, and transfer to other work and such like, rather than by the mere passage of six or 12 months. Of course, the examination has value only in so far as the information obtained is used by the physician to assist the employee. (3) *The Reporting of Complaints of Ill-Health to the Factory Dispensary.* These visits, exclusive of those for first aid and redressings in accident cases, may reasonably average five per employee per year. Most of them are for conditions to which home and patent medicine remedies are applied and for which the patient does not consult his family physician unless he is advised to do so. At most of such visits, the reassurance which many patients need and appreciate can be given. Delay in reaching the family physician when necessary is avoided. It should be recalled that commonly 75% of employees in a group are never ill in any period of a year under review. Lanza refers to one company in which 12% of the employees were responsible for 51% of the days lost in the record of illness of over 3 days' duration. In the Dominion of Canada Civil Service Report 7% of employees were responsible for 36.1% of the lost time, and for 45.2% of the illnesses. It is this 7 to 12% who should be identified and upon whom the attention of the health service should be concentrated. (4) *Supervision of Conditions of Work.* The industrial physician should be familiar with all of the hazards to health in the plant and should develop an appreciation of the workman's task, the skill he has acquired; whether his work is monotonous, the possibility of promotion, and the attitude of his supervisors. The influence of dangerous substances and of unfavorable conditions generally cannot be measured alone in terms of the number of disabling cases of poisoning. There is a large amount of general ill health associated with such conditions. (5) *Rehabilitation of Sick and Injured Employees.* As with preplacement physical examinations, a knowledge of job requirement on the part of the industrial physician should be used to place at suitable work those convalescing from sickness or injury. The industrial physician has a contribution to make in this direction to those returning to industry from the armed forces. (6) *Health Education.* While it is important to bring information to groups on subjects like nutrition and other phases of personal health, of particular value is the advice tendered to the individual employee in the light of examination findings. (7) *First Aid and Subsequent Care in Industrial Accidents.* The volume of first aid to be rendered and the opportunity for misjudging the extent of injury are too great to be left without adequate supervision. While it is essential that first aid workers be familiar with temporary splinting and treatment of shock and the control of hemorrhage, the number of cases requiring these measures is relatively small whereas the possibility of infection in wounds is high, and it is in this direction that training is inadequate. The fact that infection can be almost entirely eliminated has been frequently demonstrated."

Difficulties

THOMAS J. LYNCH, M.D., F.A.C.S., "Medical Service in Industry," presented at the War Session, A.C.S., Tulsa, Oklahoma, April 4; published in the *Bulletin of the American College of Surgeons, War Issue,* June, 1944 (29:2, 195-197). Extract: "Tulsa, until recently, had just two men employed full time by corporations, another man was dividing his time between several plants. These three were perhaps more than were so employed throughout the rest of the state. In no event before the coming of the few large war plants did we have any particular need for more. Our medical industrial problem had been continuously complicated by our industrial laws and their execution. Of necessity and convenience the industrial laws have been copied from the older states. Ours in this state have been in operation less than 25 years, and as yet do not cover industrial disease or death. For the first few years of its operation the industrial court was not a court of record, and lawyers were not allowed to practice therein. Gradually it has developed to its present condition where at least some of its findings can be reviewed upon appeal to the State Supreme Court. At no time has the prevention of injury or the health of the workers been of primary interest. These factors have been incidental to insurance costs, as has everything else concerned with this subject. This thought naturally leads to the next, that the industrial development is such that medical employment therein



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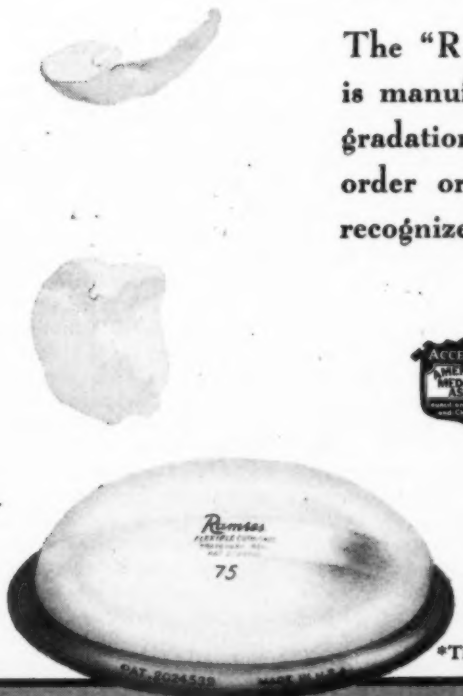

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has not been possible. It has been cared for and distributed more or less to the profession, as a whole. This distribution to the individual has depended upon many factors, most of which, I must confess, are not medical, but on the contrary social and political. I believe that this situation, plus the humiliation and disgust resulting from sessions of the industrial court, has been the reason that the majority of surgeons have violently avoided industrial surgery in every way possible. Unfortunately, on the other side of this picture, it must not be forgotten that many good surgeons are unavailable for this work due to lack of training, knowledge of industrial laws, reluctance to keep records or inability to retain sufficient office organization to do so, and in some instances liability to reach a satisfactory relationship with the industrial patient."

Women Are Different

MISS FREDA BAKER, Supervisor of Female Labor, Beaufort Division, Department of Aircraft Production, "Personal Management — with Special Reference To Women in Industry," an address delivered to members of the Institute of Industrial Management, Australia, at Assembly Hall, Melbourne, February 15, 1944. Extract: "Understanding the psychology of the woman worker is more than an emergency need—it will probably be a permanent need for management and supervision. There are many production problems which can be solved when it is realized that voice and figure are not the only characteristics in which men and women differ. The welfare of both industry and women demands that women work in ways and with supervision that is specially adapted to woman herself. From a presentation of some of the basic differences between the average man and woman, it is hoped that you will gain a clearer understanding of the psychology of supervising the working woman . . . and, thereby, find an answer to one of the most complex problems of today. BRAIN POWER: Scientific observers, even in the early years of this century, had no accurate method of determining mental differences between the sexes. When accurate tests of brain power were later applied to men and women to measure differences in general intelligence, the early test records showed that, if there was any difference between men and women, it was very slight. Most recent tests confirm this. Woman has been found to have general intelligence about equal to that of the average man. The percentage of women who possess exceptionally high intelligence has also been found to be equal to the percentage of men of exceptionally high intelligence. Such facts seem, at first, to be at odds with history, which records more accomplishments by men than by women. But women have been closely restricted for many centuries and only the most exceptional women have, by some chance of education or ambition, found an opportunity to become famous. It is a safe generalization to say that if a plant or an office is handicapped by women workers, it is no accident. It is likely to be the result of wage scales, personnel policies, and other factors which draw an inferior type of woman to the firm. On the other hand, there is a significant amount of turnover among women workers due to their having more brain power than many routine tasks involve. This needs to be recognized in promotion policies. In social intelligence it is a different story. Women excel men in a canny sensitiveness to the little knacks and graces which exalt and mislead others. The average woman can handle herself with better poise in a social group and leave fewer ruffled feelings in her wake. Women excel men, according to reported data, in sizing up the mental state of a person from what he says or from his facial expression, and also in tact and in accuracy of observation of human behavior. Women worked as machinists in the first World War. In April, 1916, there were 1,260,000 women in England doing machine and mechanical work, which it was previously thought only men could do. In the second World War this number increased until, today, women operate machinery that would have frightened men a few decades ago. The marked superiority of woman's memory is so significant and so consistent at all ages that it merits special consideration, but the reason for it is a puzzle. It may be due to her brain weight, which is slightly greater in proportion to her body weight. It is not due to a larger percentage of 'grey matter' in the brain, for the brain of both men and women has, on the average, 89% given over to the cerebral hemispheres. It may be due to microscopic or chemical differences in nerve tissue which have not been discovered. Whatever its cause, the fact remains. Their better memory is not due to their working more seriously, although it must be recognized that women are more industrious. Their greater application is an added advantage giving them a double advantage over men. STRENGTH: Man on the average is physically stronger than woman. Woman may be adapted for some kinds of muscular work, but not for the same types as man. Of course, there are some women with strength enough to make a living as blacksmiths or firemen, but these are exceptions. Of course, women are not as large as men—they are some five inches shorter. However, the differences in the relative strength of the two sexes are greater than any differences in mere size. The average woman's body, for instance, is 35% muscle, while the average man's is 41% muscle. Women's muscles are proportionately longer and thinner, and their muscles fibres are less viscous. Fifty-four per cent of a woman's weight is strength, whereas the corresponding figure is 87%. This ratio of weight to strength varies from one muscle to another. The woman factory worker will gain some strength in those muscles that she uses, but such work will develop only a very few women to be as strong as the average man. Work must be so arranged that the women employees can work easily and steadily without heavy muscular activity, and the weight of units handled and materials used are considerations in these respects. As a general principle, parts handled should move horizontally, not vertically, to minimize the need for strength—slide, not lift. It may be a good thing that women are not, as a rule, interested in athletics and the development of more powerful muscles, as it has been noted by many scientific observers that feminine muscular development interferes with motherhood. What woman needs—and has—is a good system of involuntary muscles. Woman has plenty of muscle and oxygen-carrying power for the simple household duties. She has ample development for a multitude of office tasks and light factory work. She can stand loss of food and deprivation of sleep better than men, and she has greater resistance to many diseases. However, lesser muscular strength of women is an important factor in their fatigue in many kinds of work. FATIGUE CHARACTERISTICS: It is the woman in office, factory or store who gets physically tired and it is the realization of this fact that has necessitated the installation of rest rooms and rest periods for women workers. Woman's lesser strength is one cause of this, but blood differences may often be more significant. The modern compound microscope has revealed that woman's blood is very different from man's. Every cubic millimeter of her blood—a small drop about the size of a pinhead—has a million and a half fewer red blood corpuscles than man's. Woman's blood is 80% water; man's blood is 75% water. The red cells supply energizing oxygen to the rest of the body. Woman has 30% fewer of these red cells. This helps to account for the fact that she tires more readily, although there are other contributing factors. Fainting is a characteristic of woman. Her fewer number of oxygen-carrying red blood cells predispose her to these dramatic swoons. Women are to an extent born anemic. The number of white blood corpuscles is about the same in men and women. These fight disease germs that invade our bodies, and, since women are like men in white cells, we can understand why their resistance to infectious disease is unimpaired, although they may fatigue more readily. Even before birth there are differences in the pulse rate; the last month before birth the boy's heart beats from 124 to 147 times a minute, whereas the girl's beats from 135 to 154 times a minute. Throughout healthy adult life the man's pulse rate is 72 and the woman's 80. Woman's heart is about

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(1) West. J. Surg., Obst. & Gyn., 51:150, 1943.
(2) Clin. Med. & Surg., 46:327, 1939.
(3) Am. J. Obst. & Gyn., 46:259, 1943.

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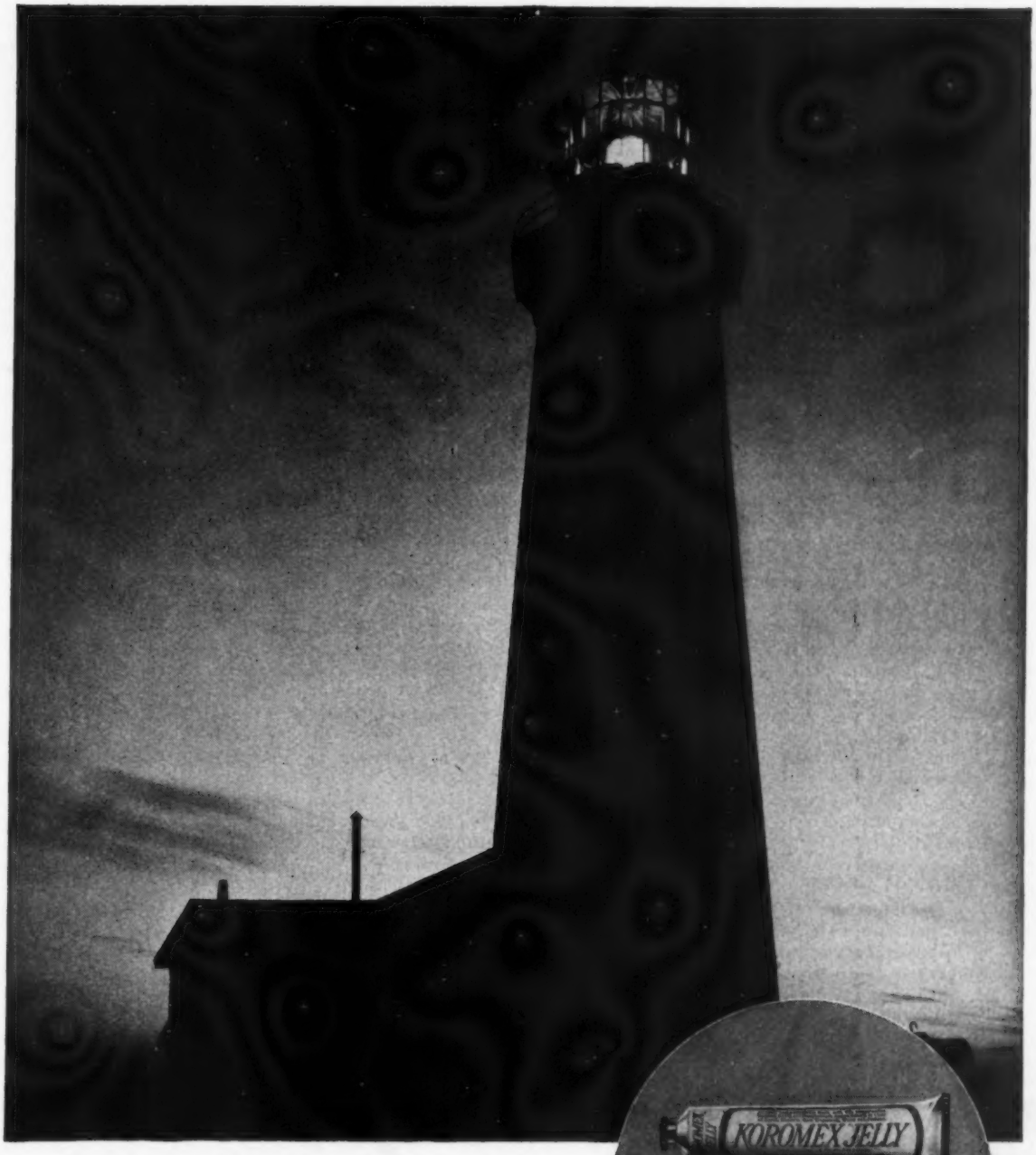
two ounces smaller. Each minute woman's heart beats from eight to 10 beats more than a man's. By the time she dies her heart has struck off some 300 million more beats than a man's. During sleep everyone's heart is slowed and blood pressure lowered. On waking up, both are increased—women's more than men's. Men's shoulder are distinctly broader, while it is women's hips that are wider. And it is these bony differences that contain the secret of woman's relatively limited endurance. Broad shoulders indicate ample development of the heart and lungs, which provide the credit needed for strenuous work. Dr. A. V. Hill, the distinguished English physiologist, has pointed out how muscular work is done on credit, by running up an oxygen debt. When a muscle contracts, chemical changes take place. The by-products of this change can be eliminated only by oxygen which is carried to the muscles by the blood. When a person engages in strenuous activity, the by-products accumulate faster than the oxygen supply can convert them into less poisonous substances. The hard-working person actually poisons himself. The skilled man-runner, for example, will accumulate an oxygen debt in the 10 seconds of the 100-yard dash, and it requires two or three hours for the blood oxygen to pay off this debt. That is why people breathe rapidly and their hearts thump faster after exertion. The rapid breathing gets more oxygen into the lungs, and the faster-flowing blood carries more of it to relieve the condition of the semi-poisoned muscles. The average woman has her greater development in the stomach and other organs in her lower abdomen. Her lungs are not sized as generously as man's, and it is difficult for her lungs to take in oxygen to pay off the debt of muscular fatigue. Her blood itself would not absorb as much oxygen, even if her lungs took it in, for she has around 30% fewer red cells to carry oxygen to relieve the half-narcotized muscles. Women doing men's work in a man's way need not only the lung development of the average man, but also the oxygen-carrying power of man's blood. REST PAUSES: Women obviously have a greater need for rest pauses so that the oxygen debt will not accumulate and decrease output. Special provision should be made for a comfortable, attractive rest room fitted with couches and chairs in which women can really relax. A matron or nurse in the rest room in larger establishments is a wise investment. The average woman worker tends to have a greater output at the end of a day if she has been given rest periods. Not only does she work faster and more efficiently both before and after these rest periods, but also she works with greater accuracy and zeal. Some factories have regular exercises scheduled during rest periods, and these have been found to be beneficial. The effects of the rest pause are not always immediate. In most operations output does improve sooner or later, but there is always the possibility of too much rest pause, or of pauses at the least crucial times. The crucial point at which to introduce the rest pauses has been found to be just before the hourly production curves begin to drop downward. Usually this is a little after midpoint of the forenoon and after the midpoint of the afternoon work periods. Work simplification, in the sense of eliminating needless motions, is related to the need for rest. There are indications that the average woman worker is not inclined to do this herself and the need for some centralized planning to reduce motions may become evident as the percentage of women workers increases. The desirability of comfortable working conditions cannot be overstressed. Women will tire quickly if their chairs, tables and tools are not comfortable and readily accessible to them. Working in a stooped position is most fatiguing. The wise executive recognizes that a woman is a woman whatever the task he may set before her, and it should be planned for her—not for a man. MUSCULAR CONTROL: The average woman is definitely slower to use her muscles in an out-of-the-ordinary situation. Although a woman's muscles may be able to move just as rapidly as a man's, women do not use them as rapidly. Something happens in a woman's nervous system that slows down her reactions, and it has been found that women show marked delay in their decision times. That this slowness is not due to changing her mind, but, primarily, to her delay in reaction, is shown by a study reported by Dr. Edwin G. Fleming, American psychologist, who concluded that 'women do not change their minds to a greater extent than men; in fact, the situation is, if anything, the reverse.' This delayed decision time is, of course, a disadvantage in cooperative games, but not in routine work. Women are faster than men in light, rhythmical activities, but, as soon as they have to make a decision, even of a minor sort, their reaction time is lengthened. A personnel officer should recognize this slow reaction when making recommendations for any jobs that demand quick decisions. Production engineers must arrange the work in detail, so that the need for making even minor decisions does not arise. When planning routine work for a group of women workers it will be found that time will be gained if this slower reaction time is considered. It will pay to take extra time in the beginning to subdivide the work until it is wholly routine. This standardizing of work also decreases the need for questions. Routine workers are usually indignant when asked to do different work in an emergency—they dislike being interrupted and forced to change their line of thought and motion. A change of manufacturing process, or alteration in office routine, is doubly handicapped in the case of women workers. The natural conflict of habits of doing things is added to the difficulty of decision. But when the new methods lessen the need for decisions, the change is accomplished more smoothly, and with less loss when a change-over is made. INFLUENCE OF SKELETAL DIFFERENCES: Everyone, of course, is familiar with the fact that the average man is larger than the average woman. But these bony differences are more than a simple matter of size. Women are not just small men; they are differently formed and proportioned. Woman's bones help to make her superior in dancing, although they make her deficient in other exercises. Not only are her joint surfaces smaller and her elbows and knees knocked in a little, but the proportions of her bones are different. Her legs are short in comparison with her trunk length. This is one reason why women do not handle tools the same way as men. Women handle things differently from men, since their thumbs are shorter and the index fingers larger, proportionately. Tools need to be especially designed for women. Industrial engineers took woman's bodily proportions into consideration when they discovered that the height of a woman's work-bench should be different from that of a man's, if the highest efficiency is to be obtained. The height of the work-bench should be about 60% of the height of the worker. If it is less than 55%, or more than 66%, the efficiency of the worker decreases. However, there are complications even in such a simple matter as body proportions. Women's skeletons are widest at the hips, whereas men are widest at the shoulders, reflecting the fact that in women the abdominal organs predominate, while in men it is the organs within the chest cavity. Women's hips are made still wider by the normal tendency for fat to accumulate there. It is this larger percentage of fat that makes them excellent swimmers. Woman's trunk is long, while her legs and arms are short. Deep shelves, or top shelves, cannot be reached without strain, and this should be taken into consideration when planning them. Assembly and other benches tend to be too wide for the average woman to cover efficiently. Work layouts for women should be designed on the basis of 10% shorter reach than for men. It has been found that the average elbow height of women factory workers is 39.9 inches. Thus her work-bench should be about 37 inches high. If a woman is to do efficient work in any field of industry her bodily proportions must be considered by the employer. Chairs, desks and benches should fit her figure. Cases, machinery and tools should be arranged within easy reach. It is also important for her to have tools which she can handle easily. In other words, the working place for a woman should be arranged for a woman—not a man. Woman's head is narrower and longer, more oval-shaped than the average man's. Women tend to be oval and men



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square in head contours. This difference is present before birth, and explains the more difficult birth of boy babies. There are other less easily seen differences in the bones of the male and female head, differences so marked that the anthropologist can tell whether a Stone Age skull is of a man or a woman. Look at the ridge between the eyes of men and women. Woman's skull is smooth between her eyebrows, while man's has a prominent bony ridge there which is known as the glabella. This makes man's eyes appear more deep-set, his eyebrows more prominent. Not quite so easy to detect is the tendency for the average woman's forehead to be more vertical. The man's forehead slopes backward, while the woman's is straighter. At the back of the head, at the center, where the skull leaves off and the spinal segments of the neck begin, there is another distinctive difference between men and women, a difference that has been present for centuries and that time can never wipe out. This is a small sharpish projection that is found in men, but not in women. Under each ear, and slightly to the back, is the mastoid process, which is also larger in man than in woman. But brain size and weight also furnish interesting contrasts between men and women. The average man's brain weighs from 1350 to 1400 grams, while the average woman's brain ranges from 1200 to 1250 grams. Woman's brain thus is about 10% lighter than man's. This is really a mark of brain superiority, but in size only. For woman's total body weighs from 15 to 18% less than man's, giving her relatively more brain ratio. When we further consider that woman's body weight contains more fat, we discover that woman has more brain weight in relation to the amount of body than the brain has to control and guide. In relative brain size woman thus excels man, as well as the highest apes. For a moment, let's look at the other end of the skeletons of these interesting sexes. At their feet and, especially, at their big toes. Of course, men have bigger feet and wear shoes that fit. But more women than men can move their big toes—which might be significant for an armless person who has to write with his feet. JOINTS: Woman's thigh bones, for instance, incline inward toward the knee, while man's are relatively straight. This results in all women being, in effect, slightly knock-kneed as compared with men. Ordinarily, this is not observed even by the women themselves, since the greater proportion of fat on the thighs conceals the unusual angle of the bone underneath. As a result it is more difficult for woman to keep her balance. Woman's weakness is to stumble or fall down, as every insurance company knows. Some men, who do not understand why this is, lay the blame solely on the high heels women wear. High heels most certainly assist in making women more unstable on their legs, but the basic reason is the built-in instability in thigh bones. The high heels merely make it worse. So do some floors and minor obstructions. When it comes to running, the average woman has to throw her leg around in circles from the knee down. It is not skirts, but anatomy, that causes this 'running around in circles.' Foot levers for machines operated by women should trip with light pressure, and should also be placed close to the floor. The ideal for women is a foot lever similar to the accelerator pedal of the motor car: operated by the toe without removing the heel from the floor. Women are not only knock-kneed—they are knock-elbowed as well. This is another reason why women handle tools in such a way as to make the process appear awkward to men and the results uncertain. The bones of women's forearms are attached to the bones of the lower arms at an angle. Men's arms form a straighter line, while women are truly knock-elbowed. In some factory operations it places her at a disadvantage over her masculine colleagues, as she has to work harder at the same task. Certain types of rotary arm motions are particularly fatiguing to women as a result of their different joint construction. Automatic screwdrivers should be used whenever possible. These joint constructions can be put to work properly or they can give the basis for neuritis-like pains in arms, shoulders, legs and thighs. In some respects women's joints are superior. Women laugh at the trouble men have inserting their back collar button in the stiffly starched collarband; this seems easy to women who are used to buttoning some dresses in the back. But it is nature who made this easy for women—another muscular peculiarity, localized in their latissimus dorsi muscle. One end of this muscle is located along her lower ribs at the back, and the other is on the arm bone. Men have this same muscle, of course, but it is differently proportioned. In still another way nature has let womankind follow a somewhat angular line of development, although the symmetrical deposits of fat which her most active thyroid gland lays down under her skin conceal these angles of her bone junctions. Woman cannot stand so erect as man. Her softly rounded body is bent slightly forward at the hips. Her walk, in consequence, is more swaying, and — sinuous. Woman's handwriting is distinctive, as a result of these slight anatomical muscular differences. Women's body proportions, in their hands, give them the advantage in handling small, delicate objects—they excel in finger dexterity. CONCLUSION: Time will not permit covering all the mental and physical characteristics of women, but you will readily agree that, psychologically, women are more prone to discouragement than men. They require more praise than censure and they react to working conditions quicker and are less troubled with the details of their job than they are with the persons with whom they work. Women take all these differences in physique and make-up seriously—much more seriously than they will admit, except under the skilled ferreting of psychoanalysts. They feel, perhaps unconsciously, that they have been cheated in the lottery of nature. This gives a clue to the secret of managing women: TELL THEM THEY ARE DOING BETTER THAN MEN. Quite likely they are—but they crave reassurance. Tell them, and keep on telling them. Recognizing these things about women workers to be generally true, then on the degree to which factory adjustments are made to meet them depends the extent to which female workers can be employed in production plants."

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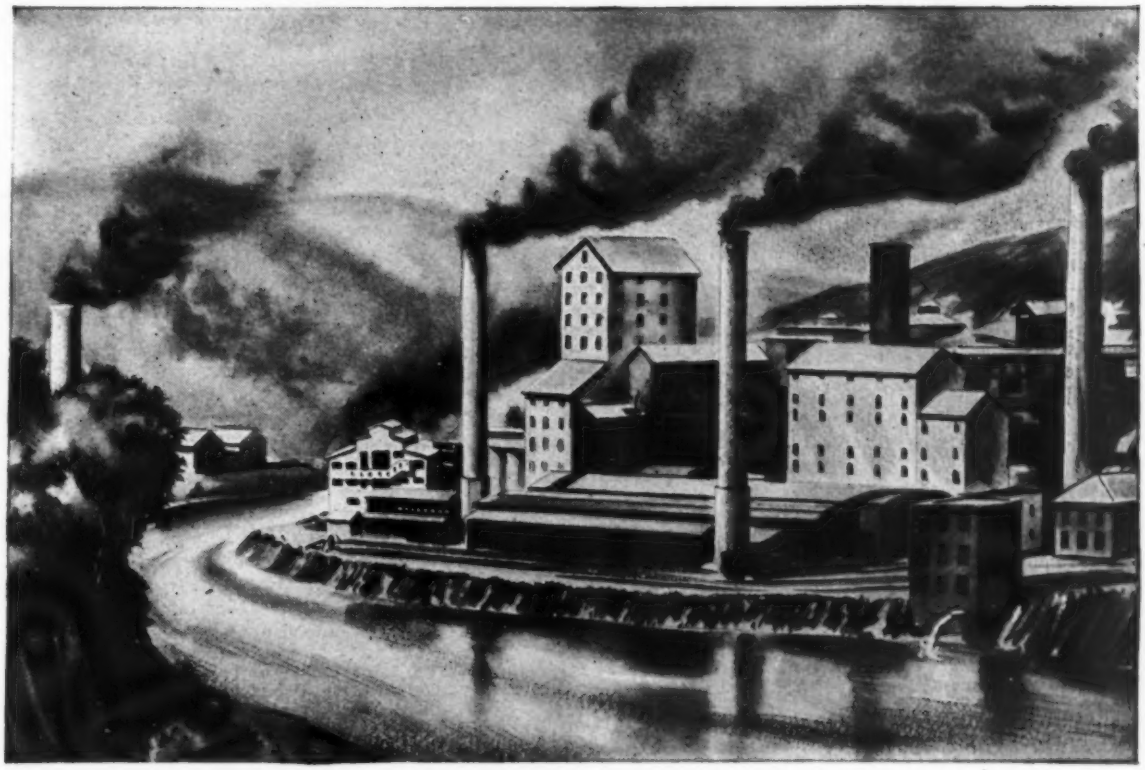

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SUPPLIES

ACTIVITIES of STATE HEALTH DEPARTMENTS

Indiana

ANNUAL REPORT of the Division of Industrial Hygiene, for the Fiscal Year ended June 30, 1944; LOUIS W. SPOLYAR, M.D., Director: On November 9, 1940, this Division developed a program emphasizing the relationships of the Division's activity to the state's defense program. This defense program formed the basis of our operations until November 11, 1943, when a three-point war program was adopted. Complete details of the defense program may be found in our annual report for 1941-1942 while the complete details of the war program may be found in *The Monthly Bulletin*, Indiana State Board of Health (46) January, 1943. During the fiscal year ended June 30, 1944, the entire efforts of the Division were directed toward the accomplishment of the war program adopted in 1943.

FIELD VISITS: In the execution of the war program a total of 146 separate plant surveys, studies or inspections were made during the year. Every plant in this group was engaged in war production as either a prime or subcontractor. The 146 plants visited reflected a total plant population of 57,705 workers, roughly 8.87% of our entire industrial population. Owing to the limited personnel available it was impossible to visit more plants.

A breakdown of the 146 field visits showed that the field activity was initiated as a result of the following:

REQUESTS FOR SERVICES BY:	NUMBER
(a) Plant management	34
(b) State Labor Department	11
(c) Complainees (other than unions)	5
(d) Labor unions	3
(e) Internal Security Division (Army)	3
(f) War Manpower Commission	2
(g) Federal Labor Department	79
(h) Follow-up studies	7
(i) Morbidity reports	1

TABLE 1
RECOMMENDATIONS ISSUED FOR CONTROL OF FOLLOWING:
(TOTAL 354)

Dermatitis due to (Total 151)	No. Recommendations
Cutting oils	81
Solvents	27
Synthetic resins	27
Fluorides	4
Anti-rust compounds	3
Rubber accelerators	3
Glass tape	2
Zinc chromate	2
Cyanides	1
Walnut wood	1
Trichlorethylene inhalation	44
Silicosis	31
Lead poisoning	23
Sanitation	21
Paint solvent intoxication	21
Plating fumes	21
Nuisance dusts	12
Selenium poisoning	7
Cyanide poisoning	5
Welding fumes	5
Mercury poisoning	4
Cadmium poisoning	2
Carbon monoxide	2
Fluorosis	2
Methyl ethyl ketone inhalation	2
Metal fume fever	1

TABLE 2
LABORATORY DETERMINATIONS
(TOTAL 325)

	Number
Dust counts	94
Solvents	33
Free silicon dioxide	25
Atmospheric lead	21
Screen analysis	18
Urinary lead	17
pH	14
Carbon monoxide	12
Benzol	12
Total silica	11
Trichlorethylene	10
Cyanides	8
Soap analysis	7
Cadmium	5
Methyl ethyl ketone	5
Fluorides	4
Urinary selenium	4
Bacteria in oils	4
Oil	3
Amyl acetate	2
Butyl acetate	2
Ethyl acetate	2
Blood CO	2
Nickel	2
Acetone	2
Hydrochloric acid	2
Carbon tetrachloride	2
Zinc	1
Ethyl alcohol	1

TABLE 3.
OFFICE CONSULTATIONS
(TOTAL 158)

A. Questions relative to the control of exposure to:	Number
Cutting oil dermatitis	18
Lead	3
Silica	3
Ammonia	2
Fluorides	2
Acid fumes	2
Emery dust	2
Mercury dust	2
Dermatitis due to leather	2
Brucellosis	2
Selenium	2
Halowax	2
Carrot dermatitis	2
Hydrogen sulphide	1
Alfalfa dust	1
Welding fumes	1
Hydrogen cyanide	1
Toluol fumes	1
Dermatitis from fiber glass	1
Dermatitis from synthetic resins	1
Cadmium	1
Carbon monoxide gas	1
Hemp	1
Iron dust	1
Trichlorethylene	1
Rosin fumes	1
B. Questions relative to the toxicity of:	
Lead compounds	5
Benzene	5
Cadmium	5
Methyl ethyl ketone	4
Mercury	3
Cotton dust	3
Indium	3
Copper	3
Pentachlorphenol	3
Trichlorethylene	3
Carbon tetrachloride	3
Zinc chloride	2
Gasoline	2
T.N.T.	2
Synthetic resins	2
Emery dust	2
Ethyl alcohol	2
Stanisol solvent	1
Plastics	1
Zinc chromate	1
Glass dust	1
Cyanides	1
Cutting oils	1
Rubber dust	1
Phosgene	1
Glycols	1
Alcohol	1
Wheat dust	1
U. V. Light	1
Tetryl	1
Alkalies	1
Potassium dichromate	1
Brass	1
Hydrogen sulphide	1
Rockwool	1
Sulphur dioxide	1
Ammonium nitrate	1
Selenium	1
Fluorides	1
Halowax	1
C. General questions:	
T.B. in industry	5
Treatment silicosis	3
Organization, this Division	2
Industrial soaps	2
Fungus infections industry	2
Lead intoxication	2
Use of protective clothing	1
Syphilis in industry	1
Sanitation in industry	1
Method of doing T.N.T. urine test	1
Diagnosis lead poisoning	1
Laws on occupational diseases	1
Methods of analysis for silica	1
Methods of analysis for carbon monoxide	1
Method of sterilization rubber gloves	1

TABLE 4.
OCCUPATIONAL DISEASES REPORTED
(TOTAL 634)

Dermatitis due to: (Total 533)	No. Cases
Cutting oils	310
Anti-mildew agent (canvas)	25
Anti-rust compounds	18
Tetryl	17
Rubber antioxidants	15
Acids	13
Cause not stated	12
Alkalies	9
Solvents (not specified)	9
Carrots	8
Dye	8
Glue	8
Synthetic resins	8
Corn	6
Fish oil	6
Paint	5
Smallpox virus	5
Phenol oil antiseptic	3
Textiles	3
Carbon tetrachloride	2
Emery dust	2
Evergreen trees	2
Thiamin chloride	2
Varisol	2
Wood	2
Woolen cloth	2
Benzene	1
Brass	1
Candy	1
Celery	1
Cement	1
Copper	1
Eggs	1
Felt	1
Fir wood	1
Furniture stain	1
Gold	1
Hickory wood	1
Iron	1
Leather	1
Linseed oil	1
Mineral spirits	1
Molding compound	1
Phenol	1
Rosin	1
Selenium	1
Soap	1
Solder	1
Sporotrichosis	1
Stoddards solvent	1
Talc	1
Tin cans	1
T.N.T.	1
Tomatoes	1
Trichlorethylene	1
Turpentine	1
Water	1
Epidemic keratoconjunctivitis	34
Acetone absorption	24
Lead absorption	18
Cadmium poisoning—one death	9
Undulant fever	5
Metal fume fever (zinc)	4
Selenium poisoning	3
Silico-tuberculosis—one death	3
Silicosis	1

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BIOLOGICALS, BIOCHEMICALS, PHARMACEUTICALS FOR THE MEDICAL PROFESSION

Thus 95% of all the field studies were initiated for other reasons than our own planned programs. This again emphasizes the point that industrial hygiene services are actually sought by all groups concerned, and that our present staff is just large enough to do the urgent "request" work and does not have the time to develop other programs or undertake long detailed studies.

As a result of the 146 field studies, 354 recommendations involving 10,604 workers, or 18.4% of all the workers covered during the year, were issued for the control of various occupational diseases. Of the 354 recommendations made, 164, involving 6,656 workers, were complied with. On a population basis, 62.8% of the workers involved had better working conditions as a result of compliance with the recommendations made. Owing to the lack of personnel follow-up studies, in order to secure greater compliance, were impossible. For a detailed analysis of the recommendations made see Table 1.

In the completion of these field studies it was necessary to perform 325 chemical analyses, 282 air flow measurements, 43 physical examinations and take 7 x-rays. Table 2 shows the complete analysis of laboratory determinations made.

OFFICE CONSULTATIONS: In addition to the field work, 158 specific requests for information on various subjects were received by telephone, letter, or personal visit. For the type of information wanted by these various interrogators, see Table 3.

INDUSTRIAL NURSING: Fifty-three plants were visited by the industrial nurse during the fiscal year. Emphasis was continually placed on rendering services to the small plants; five of the 53 plants employed less than 1,000 workers.

In addition to the field visits, consultant, in developing an educational program, helped organize the Evansville Industrial Nurses Club as well as helped develop the policies and program for the Industrial Nurses Section of the Indiana State Nurses Association. Lectures on industrial nursing were given in South Bend, La Porte, East Chicago, Richmond, Fort Wayne and Indianapolis, for the Indiana University Extension Center.

Three periods of observation were provided for nurses beginning industrial nursing services by allowing them to spend time with the consultant as well as visit plants during field studies.

REPORTING OCCUPATIONAL DISEASES: During the year 634 cases of occupational diseases were reported to this Division. In all too many instances it was impossible to follow up these reports because of lack of personnel, nevertheless, all reports were tabulated as to source and in many instances served as a basis for further study. All major outbreaks were promptly and thoroughly studied. Of the 634 cases reported 533, or 84% of all the diseases reported, were industrial skin diseases. Of the 533 industrial skin diseases, 310, or 58%, were due to cutting oils. Year after year cutting oil dermatitis looms as our most frequent industrial disease. See Table 4 for complete list of occupational diseases reported.

EDUCATIONAL ACTIVITIES: Articles for various publications and for general distribution were prepared on the following subjects: "Cadmium Poisoning in Industry," "Dermatitis from Carrots," "Industrial Medicine," "Industrial Nursing," "The Use of Respirators in Industry," and "Tuberculosis in Industry."

Thirty-four lectures were given by various members of the staff on practically all phases of industrial hygiene.

In cooperation with the Indiana State Medical Association, the Second Industrial Health Conference was held in Indianapolis, April 19 and 20. The theme of the conference was the placement of the physically handicapped veteran in industry.

Utah

WHEAT dust containing 1.2% quartz insufficient to cause silicosis over a 10-year period. An investigation carried out by the Division of Industrial Hygiene, Utah State Department of Health, to secure information pertaining to an alleged claim of silicosis contracted by an employee of a mill and elevator company, produced the following results:

Engineering	Size Fractions in Microns				
	149-105	105-74	74-62	62-44	Total Quartz
Composite dust sample	5% quartz	2%	2%	2%	1.2%

MEDICAL: Ten-year exposure period. No active tuberculosis. Slight markings on lungs and two or three calcified nodules. No typical silicosis pattern, as defined by the Utah Compensation Act. Claim disallowed by court.

New Jersey

THE Bureau of Industrial Health of the State of New Jersey Department of Health is beginning a program to study and improve the industrial health of workers in the food processing and related agricultural industries. The Bureau has engaged DR. MARIE A. SENA to conduct this program of study. Information regarding the medical facilities and plant health programs of canneries, fertilizer, flour, feed, and other industries will be obtained. The health and sanitary facilities of workers will also be observed during this study. In connection with the above program, the staff of the Bureau is actively assisting the State Bureau of Venereal Disease Control in its clinics for agricultural and food processing workers. The Bureau is inaugurating an *Industrial Health Bulletin*, which will contain items on industrial hygiene, written to appeal to plant personnel. The publication will be mimeographed monthly and distributed to approximately 2500 plants and individuals of the state. The first issue will treat of preventing heat illness.

California

INDUSTRIAL HYGIENE *News Letter*, July, 1944: "The chlorine hazards in aluminum foundries have been shown by a study made in California to be three-fold. (1) Aluminum readily combines with the oxygen in water, releasing hydrogen gas which collects in the interstices or porosities of aluminum in the melting pot. This gas is generally removed by passing chlorine through the molten metal so that the hydrogen combines with the chlorine to form hydrochloric acid. The excess chlorine is discharged into the atmosphere above the melting pot, unless removed by an exhaust hood, but the hood must be properly designed, or only a portion of the gas is removed. (2) The chlorine gas is introduced into the bottom of the melting pot by pipes connected to the tanks by short lengths of rubber hose. These pipes may become clogged as the chlorine tanks are moved from pot to pot. As the full tank pressure may exceed 100 pounds per square inch, the rubber hose may leak or burst. Moreover, a chlorine tank may burst from overheating or from being tipped over, causing a fatality. (3) Gas burners under the melting pot are frequently unvented, so that carbon monoxide concentrations may be as high as 50 to 75 parts per million and, as phosgene is readily formed from a combination of carbon monoxide and chlorine, there is danger of both carbon monoxide and phosgene poisoning. Proper protection of the workmen requires a rather complicated system of control, consisting of venting of all gas burning devices, as well as much greater supervision of the method in which chlorine is handled . . . PROMPTED by recent occurrences of accidents and near accidents caused by drivers falling asleep while driving, a study was made of carbon monoxide exposure of drivers of a trucking system in California, by the State Bureau of Industrial Health and the Los Angeles City Division of Industrial Hygiene. A study of the findings brought the following conclusions: (1) High concentrations of carbon monoxide may be expected to be associated with downhill runs or shifting of gears rather than long uphill pulls; (2) Direction and velocity of the prevailing wind are probably the controlling factors in the occurrence of high concentrations of carbon monoxide in the cab, in cases where the truck manifolds and exhaust pipes and mufflers are in good repair; and, (3) when a large number of trucks are traveling over a highway in close array, significant concentrations of carbon monoxide may develop in the general atmosphere on the highway."

MEDICINE SURGERY

INDUSTRIAL HEALTH
OCCUPATIONAL DISEASES
TRAUMATIC, INDUSTRIAL

INDUSTRIAL HYGIENE
INDUSTRIAL MEDICINE
& RAILROAD SURGERY

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CERTAIN features of this issue are somewhat more than articles; they have almost the qualities of textbook presentation. For example, the study of common cardiac conditions by DRS. CARLISLE and GIBSON (pages 783-803), and the precision technique for intracapsular fractures by DR. WELLMERLING (pages 809-817). Many of the illustrations in the first-mentioned are embodied in the scientific exhibit which DR. CARLISLE has had on view at the more recent industrial medical meetings, and which some readers will remember having seen. The circumstances of meetings, however, are usually such that the opportunity for the quality of inspection the observer would like to give exhibits of this kind is lacking. And thus, few who have stopped to look at DR. CARLISLE'S interesting panels have turned away without the desire to see them again—and often. Here they are, in color and in detail, with amplifications and descriptions so thorough and complete as to make their inclusion in these pages, as to both form and content, an event in medical publishing. DR. WELLMERLING'S x-rays are fresh from the developing room; this is their first public appearance. But it will not be their last, for they are already in the hands of the slide-makers, who are getting them into shape for lecture purposes. . . . DR. HARRY KEIL'S analysis of the "pre-placement" (DR. CAREY MCCORD gave it this name) skin patch test (page 860) steps off into controversy. When, however, the controversialists are competent to have opinions, and qualified to express them, then controversy is the life of progress, and, we believe, should be encouraged. This seems obvious. Since it was likely, as noted in the editorial (page 822) that DR. KEIL'S comments would be freely discussed if read at a meeting, they were submitted to a number of real experts in industrial dermatitis, and the summarized consensus of their replies follows the article (page 868). . . . NOW to an item

—Continued on page 6.

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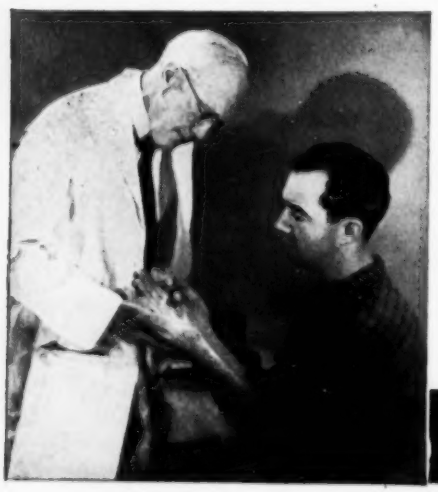

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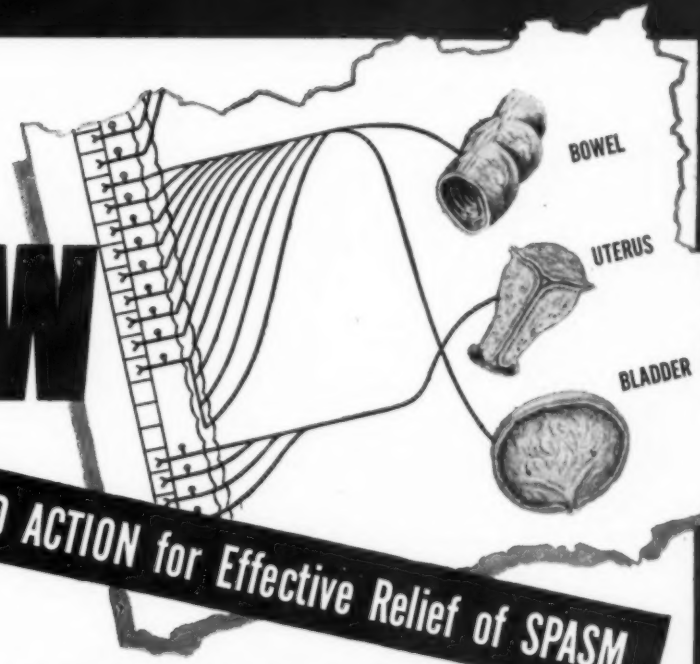

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American Association of Industrial Physicians and Surgeons. (30th Annual Meeting)
American Association of Industrial Nurses..... (3rd Annual Meeting)
American Industrial Hygiene Association..... (8th Annual Meeting)
National Conference of Governmental Industrial Hygienists.... (7th Annual Meeting)

April 24-25-26-27, 1945 **Drake Hotel, Chicago**

—*Continued from page 3.*

from *Industrial Hygiene News Letter* (page 860) which, following here, is suggestive of "from the sublime to the ridiculous"—the item, not the *News Letter*. It says: "In planning the program (industrial health), there were found duplications of inspections and conflicting recommendations for better health control made by about 20 different Federal, state and local agencies." In the interest of "health for everyone," however, is this enough agencies? Shouldn't there be another—the twenty-first, to advise the small employer how to combat the fatigue of trying to keep up with the 20? Instances of this kind are all too numerous, and their prevalence may explain, in part at least, the inertia of many of the so-called small employers where health measures are involved—for who wants to compound a headache? It is creditable to all concerned in the Seattle situation that, when this overlapping was discovered, the State's Division of Industrial Hygiene was asked by representatives of all the 20 agencies "to serve as an information bureau to direct management and labor to the agency best prepared to help them in their problems, and to assist in planning the coordination of these agencies." Wherein there is a suggestion to "small employers" in all states: "On the principle that a straight line is the shortest distance, etc., contact your State Division of Industrial Hygiene, *early* and *often*". . . . LONG ISLAND College of Medicine announces its Third intensive Post-graduate Course in Industrial Medicine to be given at the College during the three weeks October 16 to November 3, 1944. The schedule of lectures and seminars included in this Course appears on page 856. It is published in full for two reasons. One is that the interest of Long Island College of Medicine in industrial medical education, and the outstanding quality of its expression of that interest in the two previous courses, distinguish this institution as one of the really effective pioneers in this long overlooked department of learning. The other is the nature of the schedule itself. Regarding the first Course, we said: "The aim of this group is as high, and the scope of its enterprise as all-embracing, as if the Course were a curriculum major. Indeed, if it were such, it could not have been any more carefully or comprehensively planned. . . . In addition, the backgrounds and accumulated experiences of those who have it in charge are, in themselves, a guarantee that whoever enrolls with intent to learn can come away with a liberal education." (INDUSTRIAL MEDICINE, September, 1942). If that was praise

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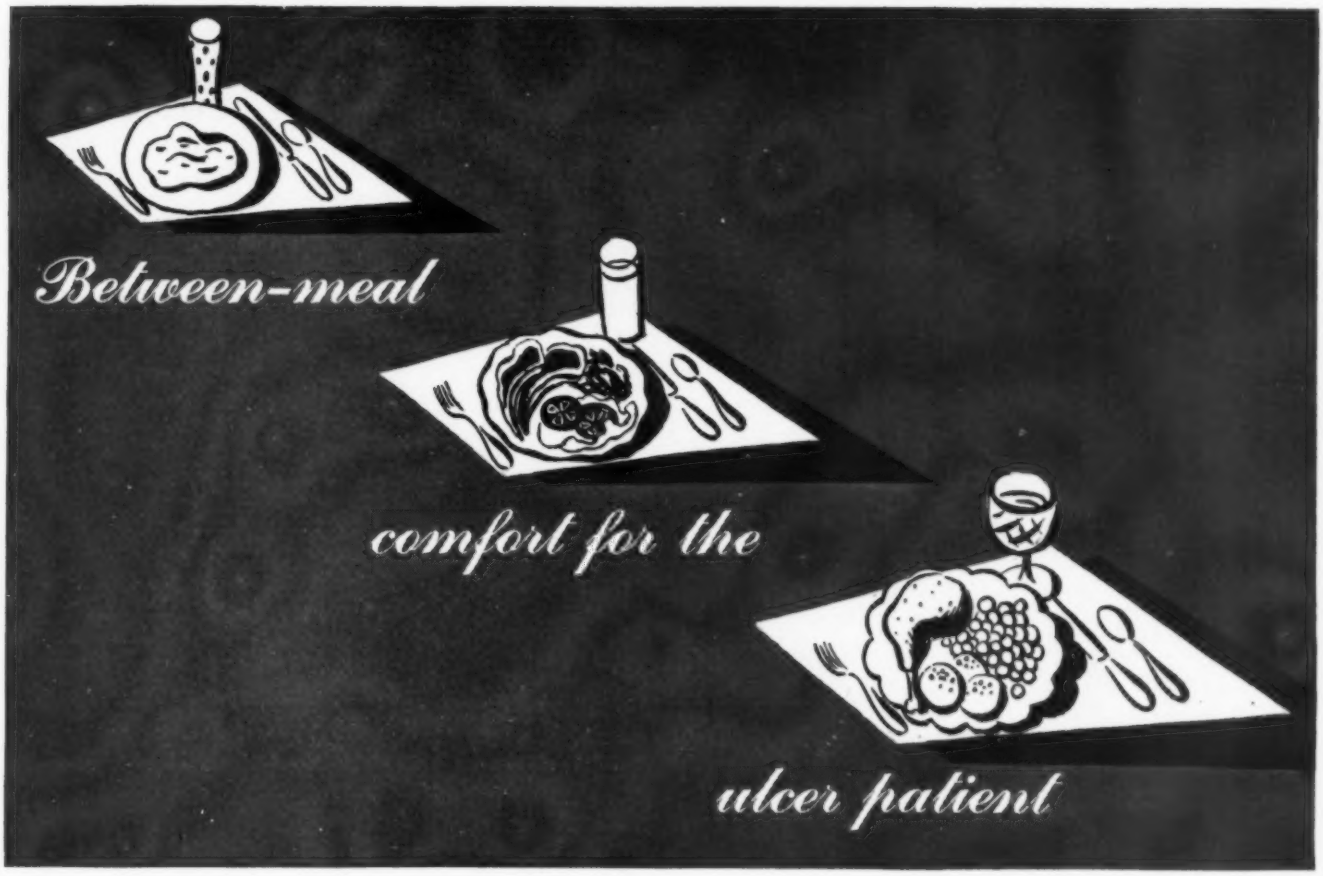

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Official Publication

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PERSONAL

THE appointment of MR. F. A. PATTY to the staff of the Medical Consultant of General Motors as an associate consultant has recently been announced. MR. PATTY'S work in industrial hygiene and toxicology at the U. S. Bureau of Mines and more recently in the insurance business has given him an opportunity for a well rounded experience. He will have charge of the industrial hygiene activities of the Corporation with headquarters in the General Motors Building in Detroit, where he will have the able assistance of MR. L. B. CASE and his staff, as well as the facilities of the Laboratories.

DR. ORLEN J. JOHNSON, since August 1, 1941, assistant to DR. CARL M. PETERSON, Secretary of the A.M.A. Council on Industrial Health, resigned, as of October 1, to accept a surgical residency at St. Lukes Hospital, Chicago. DR. JOHNSON was in charge of the Council's field activities.

DR. H. H. HUDSON was assigned to the Tennessee Industrial Hygiene Service as Director, May 1, 1944. For the past eight years he has been with the Tennessee Department of Public Health in local health work, venereal disease control and liaison officer with the Second Army Maneuver Headquarters for Middle Tennessee.

DR. W. E. DOYLE, assigned by the U. S. Public Health Service to the Kentucky State Department of Health three years ago to head the Industrial Hygiene Bureau, has been recalled to Washington. MAJOR DOYLE has been named assistant to the medical director of the U. S. Public Health Service, in which position he will supervise and be consultant for the Industrial Hygiene Bureaus of the 38 heavy-industry states that have such departments.

COLONEL ANTHONY J. LANZA was given the subject, "Present Status of Industrial Medicine," on the program of the combined Wartime Graduate Medical Meeting and Kentucky State Medical Association Meeting at Lexington, September 19.

FREDERICK S. MALLETTE, during the last two years industrial hygienist for Firestone Tire & Rubber Company, at Akron, Ohio, has become associated with the National Safety Council, Chicago, in the same capacity. He will maintain identification with Firestone in an advisory relation.

Industrial Medicine
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American Association of Industrial Physicians and Surgeons

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DR. MILTON H. KRONENBERG, since 1936 Chief, Industrial Hygiene Division, Illinois Department of Labor, resigned, as of October 1, to become assistant to DR. HAROLD A. VONACHEN, medical director of Caterpillar Tractor Company, Peoria, Illinois. In this capacity, DR. KRONENBERG will have charge of veteran rehabilitation at Caterpillar, together with the medical department's laboratory, and will be liaison officer between the hygiene department and the safety and sanitation department. DR. S. M. SCALZO will be Caterpillar's chief plant physician, in charge of all first aid, x-ray and physiotherapy. DR. KRONENBERG graduated, M.D., at University of Illinois College of Medicine in 1924, interned at Cook County Hospital, and began his career in industrial medicine with the Chicago Brass Manufacturers Association in 1927. From then until he was appointed Chief of the Industrial Hygiene Division, Illinois Department of Labor, he continued in industrial practice as medical director for a number of manufacturing concerns. He has long been active in the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, and has made many important contributions to the literature of industrial medicine. DR. HERMAN M. SOLOWAY, in charge of the Illinois Health Department's venereal disease control program since 1938, lately as Venereal Disease Consultant to Industry in the Division of Industrial Hygiene, will be Acting Chief of the Division until DR. KRONENBERG'S successor is named.

DR. CARL M. PETERSON, Secretary of the A.M.A. Council on Industrial Health, is one of the officers of Instruction in the course on special Phases of Internal Medicine, No. 5 of the post-graduate courses arranged by the American College of Physicians. This course will be given at Chicago, and DR. PETERSON'S subject—presenting the industrial medicine phase, on October 25—is "Industry Needs the Physician."

DR. FRANCIS W. BARTON, 70, of Danville, Illinois, for 40 years district surgeon for the Chicago & Eastern Illinois Railroad died September 14. DR. BARTON was a graduate of Notre Dame and received his medical degree at Columbia University. In 1909 he took two years' leave of absence to study in medical and surgical clinics in Paris, Vienna, Berlin and London. During the first World War he served as a major with the A.E.F.

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GENERAL

SILICOSIS and asbestosis were added to the list of 10 compensable occupational diseases in New Jersey, when a bill establishing an elective system of compensation was signed by Governor Edge at the close of the legislative session in April. This act will become effective January 1, 1945.

EMPHASIS on Federally-supported industrial medicine programs has taken the heat off the Wagner Bill and other proposals to socialize the healing arts. Health education, clinical aid, examinations and reference to family physicians are in the framework of the Randolph Bill which will be supported by American Medical Association, NAM, leaders in industry, government, veteran organizations and at least part of labor.

—*The Magazine of Wall Street*, September 2, 1944.

Course in Industrial Hygiene

A NEW course entitled Industrial Hygiene and Sanitation is being offered at Wayne University this fall, announced by Dean William W. Whitehouse, of the College of Liberal Arts. It deals with environmental factors in industry affecting the health of the worker and with measures of control. Registration at Wayne began September 11; classes started September 18.

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—*Occupational Hazards*, September, 1944.

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—From "X-Ray Exposure in Manufacture and Operation of Certain Electronic Tubes," by A. F. BUSH, H. T. CASTBERG, M.D., and D. G. MACPHERSON, California Bureau of Industrial Health, in *Public Health Reports*, (59:32, 1045-1047) August 11, 1944.

Pregnancy in Industry

SOME 300,000 married women who are civilian employees in more than 1,000 Army operated industrial plants, are now covered by a maternity aid plan recently inaugurated by the War Department. They include clerical workers, and represent, in all, 60% of the more than 500,000 women civilian employees of

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

CLINICALLY PROVED PROTECTION AGAINST THE COMMON COLD

The undisputed rank of the common cold as Industrial Health Problem No. 1 has aroused intense interest in all practical preventive measures.

Therefore, there has been much discussion in the medical literature concerning the value of oral catarrhal vaccines. Although their effectiveness has been questioned by some reputable investigators, the preponderance of evidence definitely shows that the incidence, severity and duration of colds can be reduced by oral vaccination.

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Brand of Oral Catarrhal Vaccine

Oravax is a small, white, enteric-coated tablet containing a wide range of antigens selected for their ability to build protection against organisms of secondary invasion responsible for debilitating sequelae of the common cold.

Published Clinical Reports on Oravax

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In Oravax group, 3.7 days lost per person per cold; in control group, 6.78 days. *Canad. M. A. J.* 41: 493 (1939)

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70.2% of Oravax group free from colds; 7.2% of placebo group. *Indust. Med.* 9: 530-3 (1940)

Incidence of severe colds in Oravax group 1/5 that in placebo group; *duration* of severe colds 0.6 day in Oravax group, 3.4 days in control group. *Journal-Lancet* 60: 319-24 (1940)

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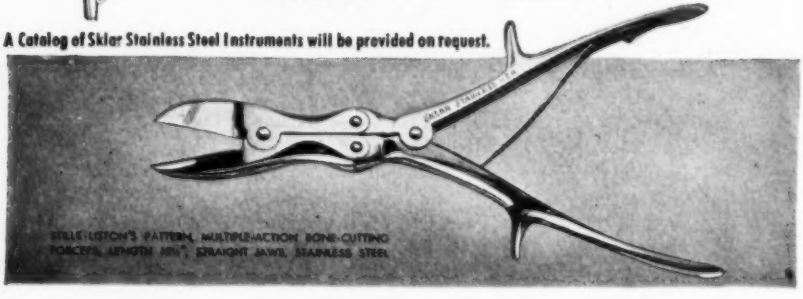

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the War Department. The program was worked out by the Surgeon General's office according to standards recommended by the Children's Bureau and the American Medical Association. Civilian personnel officers of the Army have been instructed to this effect: No employee should be asked to resign because of pregnancy; if it proves impossible to utilize her services, she should be granted maternity leave up to one year; the pregnant woman's personal physician or the plant medical officer must be consulted on her work assignment, and a transfer granted if a job is unsuitable to her condition. The following modifications of employment rules, when deemed advisable by an Army post surgeon, an industrial medical officer, or a family physician, are to apply to the pregnant War Department employee: She may not continue at work after the thirty-second week of pregnancy. She may not return to work until six weeks after delivery, and then only with the approval of her physician. When pregnancy is determined, the employee is to report her condition to the industrial medical department in order that she may receive proper supervision and be safeguarded in her work. A pregnant employee is to report to the medical industrial department every two weeks, at which time the nature of her work and hours of employment will be scrutinized. If she displays any unfavorable symptoms, they are to be reported to the employee's physician by the post surgeon, industrial medical officer, or plant nurse. Plant managers are to remember that it is not advisable to employ pregnant women between midnight and 6:00 A.M. or for more than 48 hours a week. Where possible, two 10-minute rest periods are to be arranged each work shift. Pregnant women are not to be assigned to work requiring heavy lifting or strain, nor to work which, in the opinion of the industrial medical officer or the employee's family physician, would constitute a hazard to her. As the War Department announced its plan, the Children's Bureau said there were indications that many private industrial plants were still pursuing a short-sighted policy on the question of pregnancy. In a three-month study made by the bureau in 70 war plants in 11 states, most plants were found to have a pregnancy policy which the bureau regarded as pointless and dangerous. Of 62 plants with an established policy, half ended employment on pregnancy—19 dropping the employee outright and the rest setting up some form of leave-of-absence arrangement. The 31 other plants ended employment at some specified month, ranging from the second to the eighth. While the plants sought in this way to avert the dangers of abortion, the Children's Bureau reminded them that the greatest danger lies in the first two months, when pregnancy may not be known. After that, it said, women may as well go on working for the safer third to sixth months. Dismissals for pregnancy, the bureau added, tended to cause women to conceal their condition. Contrasting with the new Army plan were the findings of a recent survey by *Modern Industry* indicating that abortion was a serious menace in those plants that discharge pregnant women even when their jobs are non-hazardous until within a few weeks of parturition. Actual or potential loss of womanpower in industry was also described to the birth of unwanted babies, and the lessened efficiency of married women deprived of a normal sex life through fear of conception. While some employers were found who encouraged the birth of healthy babies to healthy mothers by liberal policies, others were said to shy away from the problem of conception, maternity, and abortion. *Modern Industry* saw this as posing the problem of whether management should become, "directly or indirectly, the medium for spreading knowledge on planned parenthood—child spacing, or what was once called birth control." Cited as having boldly met the challenge—by giving child-spacing education to its women employees—was a Southern textile plant. At one time, an average of from six to 12 women left their jobs each Friday, had "therapeutic abortions legally performed in a nearby city," and returned to work Monday morning. In this plant, the personnel department is now providing all married women with information about child spacing. "They undergo complete pelvic examinations, are fitted for vaginal diaphragms, and taught the use of contraceptive jellies," said the re-

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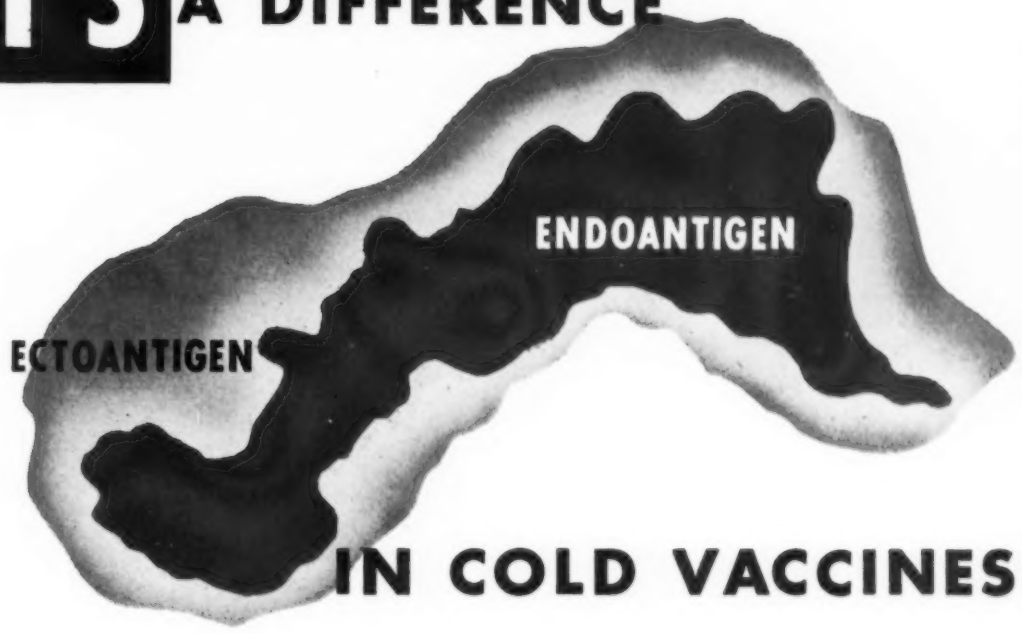

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port. "Company literature throughout stresses the fact that this is not a program to prevent conception for all time or to promote promiscuity; rather is it management's attempt to help women workers protect their health and build better families by having children when they're wanted. The pelvic examinations, incidentally, have aided this company in placing women in jobs for which they are best qualified. This in turn helps avert possible industrial injury and costly litigation." Another problem purportedly faced by personnel managers, industrial nurses, physicians, and counselors is an almost incredible ignorance among women regarding the natural functions of their bodies. For one thing, unwarranted job absenteeism was often found due to ungrounded fear about menstruation or to overstrain at unsuitable jobs.

—*Medical Economics*, September, 1944.

Tempest in Beer Bottle

OBJECTING to a proposed physical examination clause in their new contract, AFL bottled-beer handlers went on strike recently in six New Jersey breweries.

—*Medical Economics*, August, 1944.

Sprayed with Red Lead

SOME of the old and familiar poisons are coming in with new trades or coming back in old trades. I went over a great shipbuilding plant at Fall River, Massachusetts, a few years ago and was very gratified to find they were not using lead paint. They said the Navy had given it up and so they gave it up for all of their ships. That seemed to me a great step forward. Then not very long ago I was told that although the Navy still, and I believe it is true, does not use lead paint, the Maritime Commission does, and that now the hulls of ships are being sprayed with red lead paint. I do not know how carefully the men who are doing the spray painting are protected, out of doors mind you, with the wind blowing toward them—you could hardly expect the men could get to the windward spray all of the time—nor do I know how they can be protected. It would have to be of course personal protection, with an air helmet or a positive pressure mask if the protection is to be adequate. Anyway that danger has come back after we had thought it was quite sidetracked.

—From "New Problems in the Field of of the Industrial Toxicologist," Guest speaker's address by ALICE HAMILTON, M.D., Professor Emeritus, of Industrial Medicine, Harvard School of Public Health, given at the 73rd Annual Session, California M. A., published in *California & Western Medicine*, August, 1944.

Health Service, Federal Employees

A BILL to provide industrial medical service for all Federal employees, the current total of whom is about 2,700,000, was endorsed August 22 by officials of the Federal government at hearings before the Committee on the District of Columbia of the House of Representatives. A representative of the A.M.A. also testified in favor of such a bill. Thomas Parran, Surgeon General of the U. S. Public Health Service, said that the services contemplated would include a good pre-placement examination, covering a chest x-ray examination for tuberculosis, minor medical and dental care, minor care for emotional disturbances, a nutritional effort, checks on environmental factors, such as bad lighting and control of contagion and infection, and some routine care in pregnancy. The program would cost less than one cent per day per public employee, and would be administered by the Civil Service Commission in consultation with the United States Public Health Service and in close cooperation with agency heads and personnel services. Paul V. McNutt, chairman of the War Manpower Commission, said at the hearing that the Federal government has taken the lead in recommending industrial health services to its industry, but has failed to practice what it preaches, with only "the rudiments of a health service" for its own employees.

—*J. Am. Dental Assoc.*, September 15, 1944.

Medical Care a la Kaiser

THE Permanente Foundation Hospital has recently published its first annual report. Starting with six physicians and six nurses on March 1, 1942, it opened offices in Oakland, California, and began to render industrial medical care to 20,000 men of two of the Kaiser shipyards. By the end of February, 1943, it was serving 90,000 workers and comprised a staff of 62 doctors, 241 nurses and 324 miscellaneous employees. It then had available 209 hospital beds, and construction of

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White's Vitamin A and D Ointment provides the A and D vitamins from fish liver oils, in the same ratio as found in cod liver oil, and in a suitable lanolin-petrolatum base. The ointment is free from excessive oiliness, has a pleasant odor and will keep indefinitely at ordinary temperature.

In four convenient sizes: 1.5 oz. tubes, 8 oz. and 16 oz. jars, 5 lb. containers. Ethically promoted—not advertised to the laity. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

White's PRESCRIPTION vitamins

To secrete, to excrete, or both?

When lipase, the fat splitting enzyme from the pancreas is deficient and fats are imperfectly digested, the effect may be a lack of energy, too rapid heat loss, and failure to fill out the body contours—all a result of dysfunction of a *secretion*.

Desoxycholic acid has been shown to produce a marked increase in the activity of lipase.

Bile too is a secretion but it is known now as more—it is an important *excretion* as well. Bacteria, albumin, acetone, uric acid, and urea are substances that in disease may make their exit in bile.

Dehydrocholic acid is the greatest encourager of the flow of dilute bile. In its lavage of the bile ducts it helps carry out mucus, dried bile, and with them, when present, other undesirables.

This dual purpose, secretion—excretion, is stepped up by one agent—

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a 100-bed addition was begun later. Three issues of the *Permanente Foundation Bulletin*, which contain 18 papers reporting clinical experience at the hospital by members of its staff, had already been published, and many other articles have appeared in various medical journals. These indicate a high standard of medical practice. Some of the features of the report are worthy of study by all those interested in improving the standards of medical care and in providing it at a low cost to low-income and moderate-income groups. The history of the Permanente Foundation, its relations with the local medical profession, its financial statement and the medical services that it offers are reported in some detail. Some excerpts are as follows: "Our medical service and the Foundation were necessitated by the same motivating force that created the medical program for the armed services. That force was the dislocation of masses of people to areas where existing medical and hospital services were inadequate. We find that, where production for war created tremendous shifts in population, in the majority of instances medical and hospital care for these people was entirely forgotten. This was not so, however, where the armed forces directly entered production; for example, in Navy shipbuilding yards, Navy physicians, in uniform, were responsible for the care of the workers' health. When private industry was given the job, no such care was provided. The Kaiser organization had . . . a knowledge acquired from past experience in providing medical and hospital care in industry. . . . [It] had been engaged prior to the war in building huge construction projects in isolated areas, such as Coulee Dam. With no pre-existing medical and hospital facilities available, these had to be provided to the many people employed. By trial and error, a method of highly satisfactory service was worked out through the years. After Pearl Harbor when the influx of war workers into the Richmond-Oakland area created a similar lack of hospital and medical facilities, it was evident that the tested solution which experience and time had proved efficient should be put into effect. As a result Permanente Foundation was born. A charitable trust, with a Board of Trustees, headed by Mr. and Mrs. Henry J. Kaiser, registered in Alameda County, California, was set up in such a manner that there would be no profit incurred by anyone in the Kaiser organization. Any funds that may be accumulated by the Foundation must be used only for such charitable purposes as: medical research, provision of facilities in needy areas, medical care for the poor, rehabilitation of men returning from the war and so forth." Economically, the results have been rather amazing. In spite of wartime difficulties, with the associated high cost of supplies and high salaries, while receiving only pre-war income from the employees, the Foundation has accomplished the following: retired $500,000 of the debt of $700,000 incurred in building and equipping its hospitals; paid physicians' salaries ranging from $4800 to $14,000 and totaling $500,000 per year; paid a similar total to staff nurses at the rate of $150 to $200 a month; provided the health-plan members with one of the most comprehensive coverages ever attempted; and treated a group of people definitely below par physically. No physical examinations were possible under union contract, but even if permitted, the shipyards would have been forced to employ practically all these workers because of the shortage of manpower. The report goes on to mention the distrust with which the medical profession first looked on this financial plan. Gradually the profession became more tolerant as they recognized the tremendous load that the organization was carrying and the extraordinary conditions under which its job was being done. The author of the report also goes on to discuss the future of the organization and the factors on which its continued existence must depend. The advantages to the workers and to the physicians of maintaining this or a similar medical service are enumerated. Details are also given concerning the quantity and quality of medical care furnished during the period covered by the report. This report makes impressive reading and warrants more than a glance by physicians who are interested in the socio-economic aspects of medical practice.

—From an Editorial in *New England J. Med.*, August 24, 1944.

BARD-PARKER FORMALDEHYDE GERMICIDE

provides both high germicidal and sporicidal potency *plus* budget-saving instrument protection against rust or corrosive damage

Keen cutting edges and delicate steel instruments may be safely immersed for any desired period without injurious effect upon their inherent precision qualities. This feature becomes doubly important at a time when replacement stocks are at a premium.

As asepsis is the primary objective . . . knife blades covered with a dried blood contamination of *Staph. aureus* are consistently disinfected within 2 minutes. Its sporicidal properties are equally important. Within 1 hour the spores of *B. anthrasis*, and within 4 hours the spores of *Cl. welchii* are destroyed. Even the extremely resistant spores of *Cl. tetani* are killed within 18 hours. To insure the destruction of all forms of pathogenes, instruments should be continuously immersed in the Solution for at least 18 hours.

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Gastro-intestinal dysfunction in
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4. RELEASE of colloidal sulfur, so frequently deficient in the arthritic economy.

Occy-Crystine—rational, economical, and highly effective—is the preferred "saline detoxicant-eliminant" in the treatment of arthritis.

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FORMULA: Occy-Crystine is a hypertonic solution of pH 8.4, with sodium thiosulfate and magnesium sulfate as active ingredients, to which the sulfates of potassium and calcium are added in small amounts, contributing to the maintenance of solubility.

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By Charles J. Drueck, M.D., F.A.C.S.
238 pages; 30 illustrations

Sixty per cent of the adult population is said to be afflicted with pruritus perinei and yet the bedside physician does not know how to handle it. This important book is the first comprehensive monograph on this complex and distressing affliction. Published in 1938 at $5.00—Now..$3.00

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COMMENT and OPINION

THERE is nothing which will tear the vestments of civilization from a human quicker than the necessity of filling out a form. It is my firm conviction that should revolution ever occur in this country the spark will not come from a new abuse to labor by capital, but by the issuing of a new blank to be filled out and returned in 48 hours.

—Editorial, by E. H. G., in *Bulletin of the Medical Society of the County of Kings*, September, 1944.

THE field of industrial health must be made attractive to good physicians. (2) Adequately trained personnel must be provided. *No physician must be allowed to graduate into an industrial community without a basic knowledge of industrial health.* (3) Industrial health must be properly integrated into the entire community health picture. (4) The individual worker should be afforded education in personal health.

—Summary of DR. JAMES E. PAULLIN'S address on "Industrial Health," Sixth Congress, in *Pennsylvania Med. J.*, May, 1944.

NOWADAYS, there are no giants in personnel!' The charge may be true. The drama that goes with the discovery of the elements of a field adds stature to the discoverers; the teamwork required to put these elements to work gives more glory to the team than to the individual. But, has the research chemist quit because he is not likely to have an element named for him?"

—Society for Personnel Administration.

BECAUSE of the shortage of benzine, the Russian workers, P. Gavrilov and A. Egorov (*Chem. Abstr.* 38:3047, 1944) recommend the use of trichloroethylene. This solvent may be used alone or mixed with benzine in equal proportions as a satisfactory degreasing agent for linotype matrixes. An apparatus for this purpose employs sieve-like baskets. Prior to solvent treatment, the matrixes are first immersed in a soap solution. Following this soap treatment, the matrixes are repeatedly immersed in trichlorethylene or its mixture. For drying the matrixes, the temperature may be increased up to 80°-90° C. The trichloroethylene may be recovered, making the soap-solvent degreasing process a fairly economical one.

—Association of American Soap & Glycerine Manufacturers.

Benefits and Sick Claims

AN INCREASE in the amount of daily sick benefit or medical expense insurance paid persons reported sick often results in doubling or trebling the number of days of claimed sickness per person each year, ANDREW COURT, of General Motors Corporation's labor economics section, told the annual meeting of the International Claim Association, in the Edgewater Beach Hotel. Moreover, insuring persons against surgical expense causes a sharp increase in the number of surgical operations. Such insurance has shown a tremendous growth in the last 15 years, MR. COURT said, and will continue to increase. He predicted its administration would grow more difficult because of "the spreading spirit of militant class conflict and the growing feeling on the part of many individuals that they have no personal responsibility for their own economic security"

—*Chicago Tribune*, September 14, 1944.

Electric Shock

TWO fatalities have resulted from the many serious electric-shock cases in Westinghouse so far this year. Exposure to electric shock has increased very materially in our plants due to the war. Artificial respiration is the only known treatment, and a thorough knowledge of it, by competent employees, is absolutely necessary. The first few minutes following an electric shock are of vital importance, and the applicational of artifical respiration may mean the difference between life and death. All plants should carry on an annual program of teaching artificial respiration to selected groups of employees from all departments of the plants. Such a program will insure immediate treatment to the victim of electric shock.

—T. LYLE HAZLETT, M.D., Medical Director, in *Westinghouse Safety News*, September, 1944.

Now is the Time

THROUGHOUT the nation, both capital and labor have largely abated their traditional strife over hours and wages. But the striving continues and is frequently expressed in attempts to secure better working and living conditions, in the establishment of health services and benefits for employees, and in many things concerning which sound medical advice is pertinent and should be available. There has been created, in this period of unprecedented industrial activity, a somewhat artificial interest, which is above and beyond normal and valid interest in the promotion of industrial health. We should take advantage of this; the iron is hot, and now is the time to shape it. Industrial health can now be guided and established in plants where it was never thought of before and where, in the years to come, it may be difficult for it to gain another foothold.

—DWIGHT O'HARA, Chairman, in Report of the (Massachusetts) Committee on Industrial Health, *New England J. Med.*, July 27, 1944.

Small Plants

THE value of a medical service in a small plant was pointed out in an address at the business meeting of the Philadelphia Textile Manufacturers Association on July 21 by DR. GLENN S. EVERTS, Medical Society of the State of Pennsylvania, Commission of Industrial Health and Hygiene. "The War Manpower Commission," stated DR. EVERTS, "actively is interested in safety and absenteeism. Certain classes of war-contract plants must report their lost-time accidents to the government, showing the breakdown by departments, as an effort to intensify the program in those plants to cut down accidents. If a plant having a contract with the Army or Navy, shows signs of decreased production, traceable, in part, to a poor accident record, the WMC demonstrates its anxiety in the matter even to the extent of advising a medical service to be employed to help offset that experience. Post-war planning groups are quite concerned. Executives and medical departments, particularly of the larger plants, have already well-defined programs for the re-employment of their ex-servicemen who are mustered-out with some major physical handicap. The same problem will face the smaller plants." The Philadelphia Chamber of Commerce and Board of Trade have set up a Health Committee which is assisting small textile mills and other industrial plants, located close together, to establish a central dispensary, permitting small mills to obtain the advantages of medical services at normal costs. This program has been endorsed by the association and some of its members already are using central dispensaries.

—*Textile World*, August, 1944.

Management's Health

DR. WILLIAM A. SAWYER, medical director of Eastman Kodak Company, Rochester, New York recommended to conferees at the ninth Institute on Industrial Relations, sponsored by the National Association of Manufacturers, Atlantic City, September 11, that more emphasis should be placed on guarding the health of key supervisory personnel and higher executives. Pointing out that many dividends have accrued to both workers and industry as a result of long-range health programs, he urged that these be extended to include the middle and upper level employees as well. "The need for protecting the health of executives, supervisors and foremen has come to the fore during the last two years under the stress and strain of war production. Too many key men have cracked up. Naturally, the men who have risen to these positions are older. They tire out more easily, but they don't like to face the fact they are carrying too heavy a burden. Indus-

SKIN IRRITATION CASES CUT FROM 12% TO LESS THAN 1%

*within 60 days**

*From the case history records of an industrial plant employing 2000, using ELEVEN THIRTY-TWO Protective Cream and Foaming Oil Cleanser on a regular, planned basis. The steps employed are simple:

1 *Workers apply ELEVEN THIRTY-TWO Protective Cream before starting work*—remove it at meal time—re-apply when work is resumed. This cream has a *lanolin base,* compounded in such a way that when applied to the skin it will resist water-soluble irritants, petroleum solvents, acids and other known irritants.

2 *Cleansing is done with FOAMING OIL SKIN CLEANSER,* which is a sulphonated *vegetable* oil mixed with a wetting agent. It is an efficient cleansing compound possessing none of the harsh, objectionable characteristics of many ordinary cleansing materials. This cleanser tends to restore the natural protection with the aid of sulphonated oil's beneficial addition to the skin.

A GUARANTEE—based on your experience. Best proof of the value of these dermatitis preventives is your own experience. You can get this experience at no cost by using the Kolar Laboratories' *trial offer*. We will ship prepaid six one-pound jars of ELEVEN THIRTY-TWO Protective Cream, and (one gallon) of Foaming Oil Cleanser invoicing in the regular manner, but with the distinct understanding that this invoice is not to be paid unless the preparations measure up to your expectations in every way.

KOLAR LABORATORIES, Inc., Seeley Avenue & Madison St., Chicago 12, Illinois.
Distributors in all principal cities.

KOLAR *Products*
Lick Dermatitis Hazards
BY PROTECTING AND CLEANSING THE SKIN

589A

FREE BOOKLET
on Blood Plasma Equipment

An illustrated booklet covering the apparatus and equipment for various blood plasma procedures is now available. This booklet not only lists the basic apparatus but contains diagrams of donor, pooling and administration assemblies as well as full specifications on the apparatus. A convenient bibliography is included for those who wish to review the literature on the preparation of blood plasma. The equipping or remodeling of a blood bank and plasma processing laboratory is in reality a problem of plant engineering and requires a fairly wide range of apparatus and equipment. To better serve the laboratories installing a blood bank our technical staff has made a thorough study of the various processes now in use. These men will be glad to work with you in planning the new blood bank, in installing the equipment and in training your personnel.

Laboratory Supply Division

A. S. ALOE COMPANY

1831 Olive Street · St. Louis 3, Mo.

trial medicine will find it very worthwhile to insist on periodic check-ups and that these men take vacations—possibly extra vacations—when their health seems to be run down."

—*New York Herald-Tribune*, September 12, 1944.

Nursing Postwar

I DO NOT expect any new and dazzling types of industrial nursing services immediately after the war, but rather a more abundant fruition of conventional types of services. The physical welfare of the employee will receive more attention from management, physicians, nurses, and others than has been experienced during any other era. It will not be at all uncommon to find full-time nurses and part-time physicians serving plants having as few as 100 employees. The ratio of nurses to employees will be nearer one to every 200, than one to every 500 or 1,000, while it will be common practice for physicians to devote all their time to industrial work, serving several small plants on a part-time basis per plant. More and more dermatologists, ophthalmologists, orthopedic surgeons and industrial hygiene physicians will be found devoting their entire time to industry on a retainer and consulting basis. Many of the small plants, particularly those having under 150 employees, will avail themselves of services of industrial nurses who divide their time between two or more plants. Nursing agencies already are selling general nursing service to plants in several areas on an hourly basis, and it is expected that they will extend and improve such services, not to the extent of just selling more and better public health nursing care, but by providing competent industrial nursing as well.

—CRIT PHARIS, M.D., Assistant Medical Director, United Aircraft Corporation, to New York State Nurses Association, in *Modern Industry*, August 15, 1944.

Job Analysis

IN A MOVE rapidly becoming nation-wide, 2,000 employers in four leading states, Connecticut, Pennsylvania, California and Michigan, are analyzing close to two million jobs with a view to measuring their physical demands with the capacities of disabled veterans. Maryland has similar plans, and so have many other states. Employers participating include such major West Coast shipyards as Bethlehem Steel, Todd Shipyards, California Shipyards, U. S. Naval Drydocks, and the Kaiser plants in Oregon. Large employers in the east and mid-west interested: Westinghouse, General Electric, United Aircraft, Electric Boat, American Cyanamide, Carnegie-Illinois Steel, Aluminum Corporation, Hershey Chocolate, Crown Can, Ford Motor, Chrysler, Cadillac, Eaton Manufacturing, Radio Corporation of America, Armstrong Cork, and many others. Under the system, jobs are analyzed in relation to the 27 activities established as covering the whole field of jobs—for example, walking, handling, fingering, lifting, reaching, seeing, hearing, etc. "Most jobs actually require only a few of these activities. If the physical appraisal of the man shows that he can perform these, he is considered as fit as any able-bodied man for the job. The system is radically different from the guess method used after the last war. The key is: not what the veteran can't do, but what he can do."

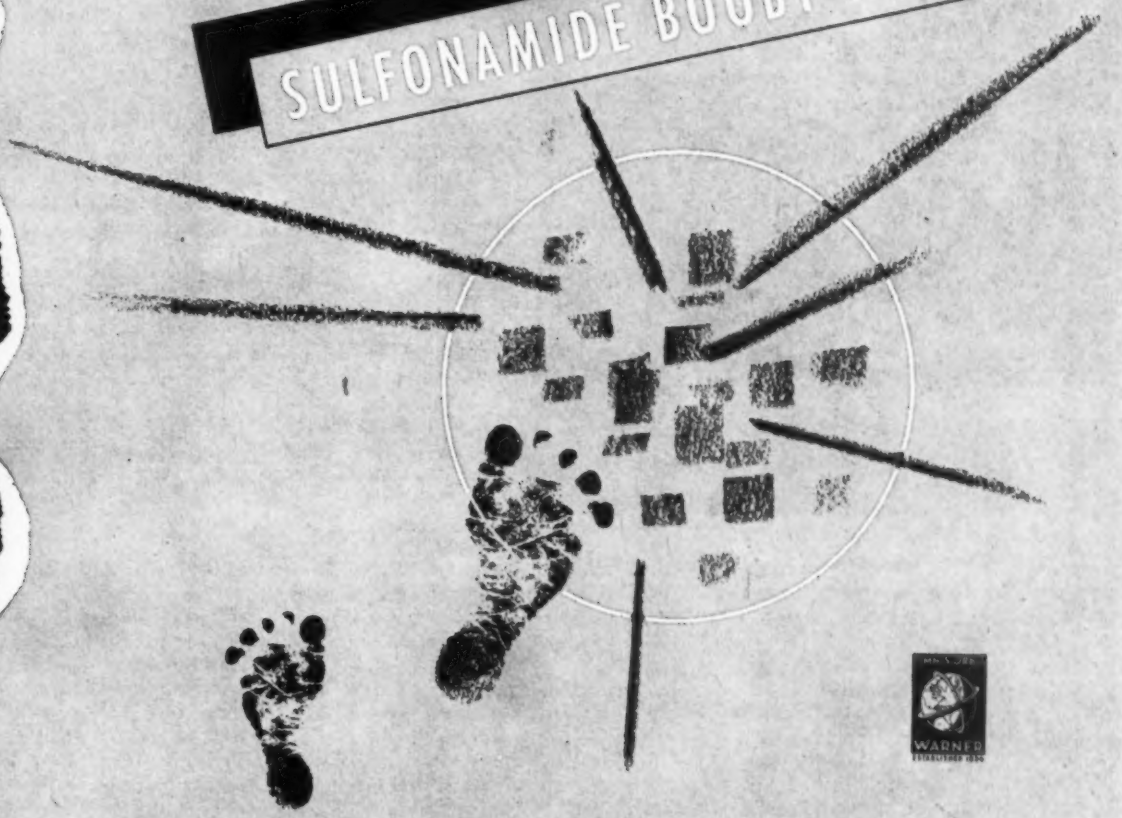
—WMC release, September 13.

The "Detroit" Plan

A CAMPAIGN for the advancement of industrial health in the small industries of the Detroit area is being sponsored by the Wayne County Medical Society. The main objective is to provide emergency care in these plants and eventually to convince the management that a health program is not costly but economically profitable, even though it necessitates an initial expenditure for first-aid stations and various equipment. When a sufficient number of doctors have notified the Society of their availability to assist in the program, letters will be sent by the Medical Society to industries in the area employing 25 to 1,000 workers, that do not employ a full-time plant physician. The City of Detroit Department of Health has offered to render service or advice regarding occupational diseases found in these plants. The plan pro-

Danger:

SULFONAMIDE BOOBY TRAP



Topical sulfonamides can be therapeutic booby traps — attractive but deceptive and dangerous. This is because sulfonamides are not self-sterilizing and may become contaminated, thus introducing infection under the guise of therapy.

'SULFATHIADOX'* Self-Sterilizing Sulfathiazole Ointment is both sterile and self-sterilizing and offers enhanced therapeutic action through oxygen potentiation. This unique preparation contains microcrystalline sulfathiazole, 5%, with oxygen-liberating urea peroxide, 1%, and chlorobutanol, an antifungal preservative, 0.5%, in a special water-washable, oil-in-water base which assures better "point-of-contact" utilization of the sulfathiazole and which is readily miscible with purulent and serous exudates.

'SULFATHIADOX' Self-Sterilizing Sulfathiazole Ointment is supplied in 1-ounce tubes and in 1-pound jars... William R. Warner & Co., Inc., 113 West 18th Street, New York 11, N. Y.

*Trademark Reg. U. S. Pat. Off.

'SULFATHIADOX' Self-Sterilizing Sulfathiazole Ointment

Thousands OF CHEST X-RAYS
...in half the number of minutes
● WITHOUT SACRIFICE OF DIAGNOSTIC QUALITY, full size 14" x 17" radiographs, at the remarkable speed of 150 per hour, are normal production accomplishments of the Paper Roll Method, pioneered by POWERS RAPID CHEST X-RAY SERVICE. This widely endorsed method for large group examinations affords the optimum in accuracy, time-saving convenience and economy.
HERE ARE THE FACTS
Low cost protection—One price, based upon the total number of persons radiographed within a determinable period, covers the cost of this important service. Included are the services of our own experienced operators and portable, shock-proof equipment.
Minimum production loss—Each subject need be away from his duties for only 10 minutes or less to have an exposure made that provides a permanent record, individually identified for file reference.
There is no obligation—Write for comprehensive data and request our qualified representative to call. We will gladly prepare an estimate for the considerate action of your Board.
POWERS X-RAY GLEN COVE N.Y. SERVICE
POWERS X-RAY SERVICE
Glen Cove New York

poses meetings at regular intervals, in each plant, of the president or plant manager, the plant doctor or his appointed representative, the plant or visiting nurse, the first-aid man, the director of the safety committee, a representative of the employees, and the personnel or employment manager. Suggested topics for these meetings include: (1) disabilities from accidents; (2) first aid at the plant; (3) physical examination and health of the worker; (4) non-compensable illnesses such as colds and infections or surgical disabilities; (5) cooperation of the family physician in cutting down loss of work days; (6) ventilation and sanitary conditions in the plant; (7) nutrition of the workers and food conditions; and (8) contagious diseases and cooperation with the public health department.

—*Industrial Hygiene News Letter*, August, 1944.

"Neighborhood" Health

BECAUSE of the administrative and other difficulties in public health work in a city of 7,500,000 population, New York was divided a few years ago into 30 Health Districts. Neighborhood Health Development, Inc., was formed with a membership of civic-minded citizens to cooperate in the Districts with the Department of Health and with scientific and hygienic organizations. District Health Committees and activities are now functioning in seven of the "neighborhood" areas, and in one of them—the Fort Greene Health District, in downtown Brooklyn—a program has been in operation for a year which promises to set a model for the nation. In the Fort Greene District, 55 factories, stores and other business or industrial establishments are participating in a continuous "health demonstration." Through this medium, education in health and in the prevention of accidents is taken to the workers at their jobs. An Industrial Committee has charge of this phase of the District work. A statement by the Industrial Committee says: "Experience has shown that production is increased when health information is regularly brought to the workers in plants, factories and firms; that education is the cornerstone of preventive medicine; and that intelligently warned and informed men and women take the necessary precautions to avoid health hazards or seek early treatment when illness occurs." The results in the Fort Greene District have shown, after one year, that the program works.

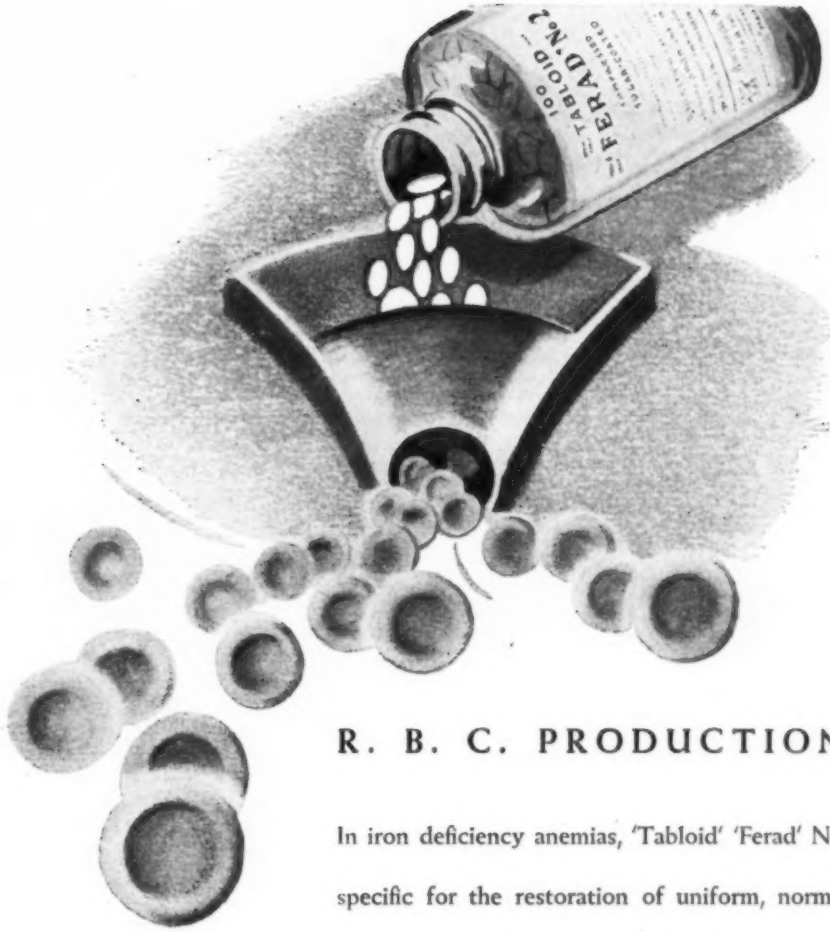
—*New York Journal-American*, August, 24.

Music Therapy

THE Institute of Applied Music has been authorized by the Surgeon General of the Army to conduct an experiment in developing the potentialities of music as an adjunct to medicine. Walter Reed General Hospital, in Washington, D. C., has been selected as the place for the experiment. To determine the effect of music in certain types of mental and nervous disorders, the Institute, a group of professional musicians, has organized to work on actual patients. The music, which in this experiment is regarded solely as an aid to treatment, and not, as popularly regarded, merely as entertainment or recreational performance, will be presented by the highest type of professional musicians. All music presented will be checked against a table of variables and applied in a pre-determined manner, subject to the requirements of the doctor in charge. Probability curves have been charted and these will be checked against actual results obtained. From this, greater refinements can be plotted, until cause-and-effect principles have been established. The Institute wants to know how the slightest gain was accomplished, to determine if it will work again and can be accepted as a rule.

Federal Encroachment

TESTIFYING recently before a Senate Subcommittee on Wartime Health and Education, Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, advocated a $1,989,000,000 public health program. He said "too much heat and not enough light" has been turned on socialized medicine, adding: "It is my belief we can have a national health program fitted tc the nation's needs and the social



R. B. C. PRODUCTION LINE

In iron deficiency anemias, 'Tabloid' 'Ferad' No. 2 constitutes a classic specific for the restoration of uniform, normal erythrocytes. A high degree of hematopoiesis is achieved with a minimum of gastric irritation, constipation and diarrhea. • 'Tabloid' 'Ferad' No. 2 contains ferrous sulfate, the most effective form of iron for the treatment of iron deficiency anemias. The inclusion of a small amount of anhydrous sodium carbonate tends to neutralize the acidic properties of ferrous sulfate and thus improve tolerance.

'Tabloid' and 'Ferad'—registered trademarks

'TABLOID'
'Ferad' No. 2
Bottles of 100 and 500

'TABLOID' 'FERAD' No. 2 SUGAR-COATED

Ferrous Sulfate, Anhydrous	Gr. 2-3/5
(Equivalent to gr. 4-3/4 Ferrous Sulfate, U. S. P.)	
Sodium Carbonate Anhydrous	Gr. 1-4/5

BURROUGHS WELLCOME & CO. (U. S. A.) INC., 9-11 East 41st Street, New York, 17, N. Y.

and economic problems of the 48 States not entirely with socialized medicine but with more private medical practice than we now have." He outlined a plan for 417,000 hospital beds and 2400 health centers and sub-centers, costing $1,989,000,000, not including the health needs of veterans, which he said the nation must place on a sound basis. "As our knowledge increases," he said, "the need grows for putting this complex science (research, diagnosis and treatment) to the service of the people by groups of trained persons working as a team. The day of the country doctor of the saddle bags is past." Parran advocated an integrated system of public health service beginning with health centers in every community feeding general and specialized hospitals.

—*Victor News*, August, 1944.

Dermatitis

UNPOLYMERIZED phenol formaldehyde resin used to glue together paper tubes employed in the launching of rocket bombs from airplanes caused an outbreak of dermatitis in a Massachusetts plant. The hands and shoes of the workers were soiled with the resin glue as it spread over the paper while the paper was being rolled into a cylinder. Of the 150 workers employed on the operation, 78 developed dermatitis and, out of 480 men hired, only 180 remained on the job. The remaining 300 left because of the dermatitis which they developed or because they feared the disease. Production was cut to less than 10. Investigations made by the Dermatoses Section of the Industrial Hygiene Division, U. S. Public Health Service, in cooperation with the Division of Occupational Hygiene, Massachusetts Department of Labor and Industries, showed the glue to be the cause of the dermatitis. It was recommended that: (1) workers should wear sleeves, aprons and gloves made of fabric impervious to the glue, gloves being changed at each half shift; (2) washstands should be placed at strategic places to enable the workers frequently to wash the soiled parts of the skin; (3) a special cleanser was recommended, as ordinary soap was ineffective; and (4) methods of treatment were recommended. . . . A LARGE percentage of workers in a plant manufacturing jungle hammocks to be used in the South Seas, developed dermatitis on the forearms and bare legs. Investigation by the Public Health Service showed that a chemical used to prevent mildew in the fabric of the hammocks was the cause of the dermatitis. Wearing of sleeves and stockings to protect the arms and legs from contact with the fabric as it was sewed on the machine was recommended to prevent further occurrence of the skin condition.

—*Industrial Hygiene News Letter*, August, 1944.

Carbon Tetrachloride

FACTORS that may increase the toxicity of carbon tetrachloride are as follows: (1) If zinc chromate is in the surface being cleansed, it may oxidize the carbon tetrachloride to phosgene, or carbonyl chloride. (2) If lacquers used have a nitrocellulose base, they may form and could form phosgene. (3) If petroleum spirits are used, they may contain unsaturated compounds such as acetylene or ethylene. Carbon tetrachloride may cause a toxic amblyopia and act on the optic nerve, causing blindness in some cases. Carbon tetrachloride may cause a vesicular rash in the hands and arms or a dry scaly condition may develop in the arms from contact. Two interesting cases of carbon tetrachloride are as follows: (1) A boy was building small airplanes in a room that did not have the best of ventilation. The dope that he used contained carbon tetrachloride. He developed severe headaches. Removing this dope and using one that did not have carbon tetrachloride and increasing the ventilation caused a complete cure of all headaches. No doubt this headache was a result of carbon tetrachloride fumes being inhaled. (2) A man was cleaning clothes in a small room with poor ventilation. He got quite sick after two hours exposure to carbon tetrachloride. He got worse for eight or nine days. On the fifth day he went to the hospital. Here

FREE HELP on Absenteeism for plant nurses and doctors...

A war plant nurse called for help—to reduce the number of absentees among women who were missing 1 to 3 days each month, frequently on "problem days."

Now, the makers of Kotex* Sanitary Napkins offer new, free material to combat this kind of absenteeism in your plant. Two helpful booklets are available to you—an instruction manual for use in classes, a handbook to distribute among your workers. Both are practical—both are *free*. Just mail the coupon. We'll send them to you right away.

* T. M. Reg. U. S. Pat. Off.

Easy-to-read free booklet designed for your workers. Lists do's and don'ts for women. Tells how to feel better and stay on the job regardless of the calendar. Discusses sleeping, drinking, showers, diet, lifting. How to curb cramps, when to see a doctor. Advice for older women.

New Instruction Manual equips plant nurses and doctors to conduct classes for women workers. Gives authoritative facts on menstruation, teaching suggestions, answers to women's questions. Send, too, for free Charts on Menstrual Physiology, for classroom display.

FREE! MAIL TODAY!

INTERNATIONAL CELLUCOTTON PRODUCTS CO.
Box 3434, Chicago 54, Ill.

Without charge or obligation, please send me:

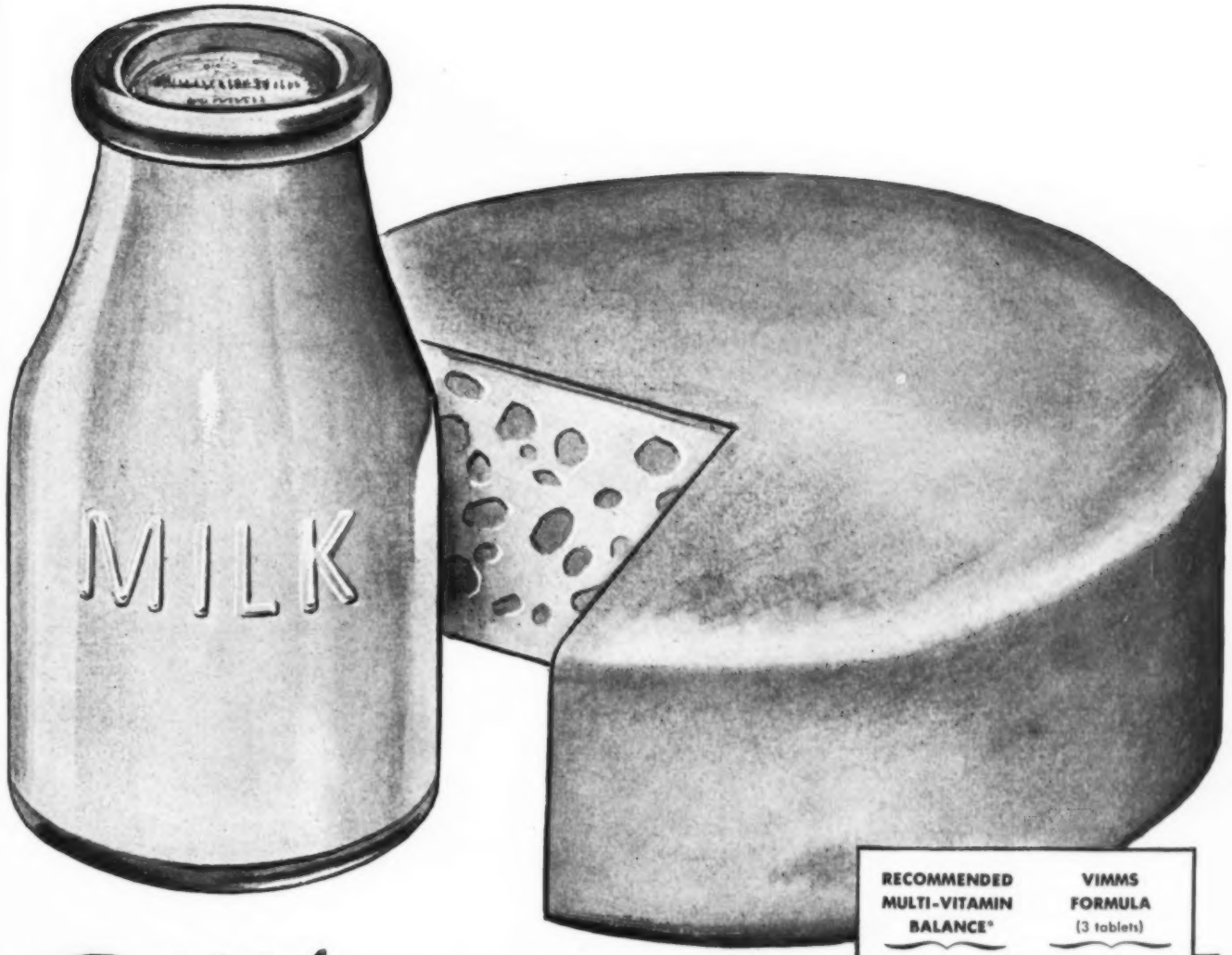
.....copies of "That Day Is Here Again" to distribute to women workers in our plant.

.....a copy of the Instruction Manual "Every Minute Counts" together with Visual Charts on Menstrual Physiology.

Name .....

Address .....

City ..... *State* .....



34% DRANK NO MILK —ATE NO CHEESE

MILK—one of the best dietary sources for Riboflavin and Calcium—is a "Basic 7" food in the Government's National Wartime Nutrition Program. Adults are urged to drink at least a pint of milk daily. Yet, according to a nation-wide poll, 34% of those questioned drank no milk . . . ate no cheese.[1]

In the face of such poor habits of food selection, many doctors, to effect dietary improvement quickly, may wish to prescribe a vitamin-mineral supplement. The Vimms formula (3 tablets) supplies full minimum requirements for *all* the vitamins known to be essential in the diet, and significant quantities of Iron, Calcium and Phosphorus—the minerals most commonly lacking.

Patients' response to diet supplementation such as that provided by the Vimms formula may be readily observed over a period of time. To facilitate such observation, sufficient professional supplies of Vimms may be had on request. Write to Pharmaceutical Division, Lever Brothers Company, Department IM-03, Cambridge, Mass. (Offer good in U.S.A. only.)

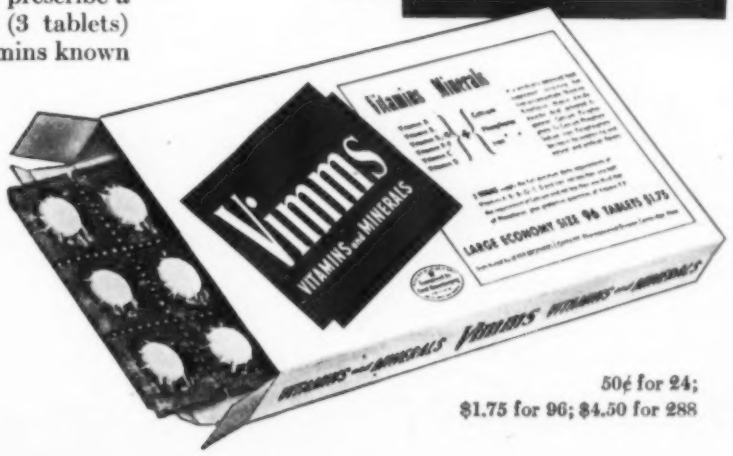
1 *Jl. of the American Medical Association, February 27, 1943.*

RECOMMENDED MULTI-VITAMIN BALANCE*	VITAMIN	VIMMS FORMULA (3 tablets)
4,000 USP Units	A	5,000 USP Units
1 mg.	B_1	1 mg.
2 mg.	B_2(G)	2 mg.
600 USP Units	C	600 USP Units
400 USP Units	D	500 USP Units
10 mg.	Niacin	10 mg.

In addition, Vimms supply the minerals most frequently deficient in the average diet.

CALCIUM ..... 375 mg.
PHOSPHORUS ..... 250 mg.
IRON ..... 10 mg.

*Journal of the A.M.A., July 18, 1942, pp. 948-9



50¢ for 24;
$1.75 for 96; $4.50 for 288

UNINTERRUPTED TREATMENT...

UNINTERRUPTED SLEEP

Such local inflammations as chest colds, sore throats, sprains, strains, contusions, boils, carbuncles can interfere seriously with the patient's required sleep and relaxation.

By providing analgesia and decongestion for eight hours or more from a single application,

NUMOTIZINE
THE PRESCRIPTION CATAPLASM
NUMOTIZINE

permits the patient to sleep without interruption throughout the night.

With Numotizine there is no necessity for frequent changes of dressings, no hot water bottles, no oral analgesic medication to upset the stomach.

Numotizine contains guaiacol, beechwood creosote, methyl salicylate, sol. formaldehyde, in a base of C. P. glycerine and aluminum silicate.

Easy to apply—easy to remove. Supplied in 4, 8, 15 and 30-ounce jars. Ethically promoted—not advertised to the public.

NUMOTIZINE, INC., 900 NORTH FRANKLIN STREET, CHICAGO, ILL.

FORMULA:

Guaiacol	2.60
Beechwood Creosote	13.02
Methyl Salicylate	2.60
Sol. Formaldehyde	2.60

C. P. Glycerine and Aluminum Silicate q. s. 1000 parts

it was found that his temperature and pulse rate were up; he had jaundice, the liver was enlarged to the navel. He had albumin and pus cells in the urine. He had severe headache, nausea, vomiting and gastro-intestinal symptoms, pain in midback. White cells and polys were raised. He had partial anuria. His abdomen was enlarged and he was very ill. It was found that he still was quite ill six months after exposure. His present condition is unknown. Beyond a doubt this was carbon tetrachloride poisoning. Carbon tetrachloride, by contact of a solution, may affect the fingernails. When it or solutions containing it are used, be sure there is ample and good ventilation or serious complications may readily develop. The vapor is especially dangerous.

—From "Carbon Tetrachloride Poisoning," by T. E. P. GOCHER, M.D., San Francisco, in *Northwest Med.*, August, 1944.

Council on Physical Medicine

THE Council on Physical Therapy of the American Medical Association has become the Council on Physical Medicine, *The Journal* of the Association announces in its July 29 issue. This is in accordance with an action by the Association's House of Delegates at the recent annual session in Chicago. Discussing the change, *The Journal* says: "The designation 'physical medicine' is a more inclusive term. Physical agents are used not only for therapy but also for diagnosis. Hospital departments of physical medicine, when they employ electric tests for reaction of degeneration or perform such tests as the cold pressor test, are employing physical agents not for therapy but for diagnosis. The Council has for some time interested itself in certain phases of occupational therapy, which is a branch of the broad field of physical medicine. The Council was informed that the American Occupational Therapy Association was anxious to have the Council give more attention to occupational therapy. Discussions between representatives of the Council and the American Occupational Therapy Association indicated that the association would welcome the inclusion of occupational therapy under a Council on Physical Medicine. Under the following definition for physical medicine, the entire field can be covered by a Council on Physical Medicine: Physical medicine includes the employment of the physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise, and mechanical devices for physical and occupational therapy in the diagnosis and treatment of disease. The Council believed that it would be wise to appoint a special subcommittee of five physicians interested in occupational therapy who could help to bring this phase of therapy more fully under direct medical supervision. Finally there is definite precedent for the use of the term 'physical medicine,' which has long been considered the most acceptable term by our British colleagues. The Conjoint Board of the Royal College of Physicians and the Royal College of Surgeons has just instituted a diploma in physical medicine. With its new name the Council on Physical Medicine will continue to function as it has always functioned, but will devote additional attention to problems of occupational therapy."

—*Pennsylvania Med. J.*, September, 1944.

Accident Proneness Index

I HAVE found these reviews and studies of first aid cases to be the most important source of accident prevention information from the plant. Most of the corrective measures made in our plant have resulted from conclusions drawn from the type and trend of reported first aid cases. Because of the importance that we have placed on the reported first aid cases, we have developed a complete form for entering the data concerning the causes of the accident. This form is filled in immediately after the first aid accident is treated and, because of the thoroughness with which these cases are discussed, we have insisted that reports be accurately and fully filled out and checked by the foremen. We are at the present time preparing an accident proneness index for each employee which is based on the number of first aid cases reported for him during the time he has been employed. This is called the Employee's Personal Hazard Index, and while we do not yet have sufficient data with which to fully utilize this index, indications are that it will prove the most valuable control of accident prevention at the plant. It is our plan to report each month to the foreman the hazard index for each employee working

HEMATINIC
PLASTULES
REG. U.S. PAT. OFF.

FOR QUICK BLOOD REGENERATION

● When you "Consider the Blood," and find hypochromic anemia, you undoubtedly want to see that the patient is supplied quickly and efficiently with iron.

The iron supplied in Hematinic PLASTULES is *ferrous iron*—the ideal form for quick absorption and conversion into hemoglobin. It *stays* in the ferrous form because it is hermetically sealed in soluble capsules that prevent oxidation.

And, as Hematinic PLASTULES quickly dissolve in the stomach, the ferrous iron in semi-fluid state is rapidly assimilated.

Available Plain or With Liver Concentrate; in bottles of 50, 100, 1000. The Bovinine Company

DIVISION Wyeth INCORPORATED

THIS LOST HAND COST ONE PLANT 132 HOURS

ENZO-CAL*, an effective antipruritic cream, not only supplies soothing, healing qualities to irritated skin . . . without the need for incapacitating dressings . . . but also supplies invisible protection to hands where gloves or greasy ointments would interfere with the work.

Sample and Literature on Request.

ENZO-CAL

ENZO-CAL (benzocaine, calamine and zinc oxide) is the drug of choice for the prevention of contact between chemical irritants and the skin, as well as for the treatment of industrial dermatitis.

*Trade Mark Reg. U. S. Pat. Off.

CROOKES LABORATORIES, INC. 305 EAST 45th STREET, NEW YORK 17, N. Y.

for him. We propose to set an index figure which, when established by an employee, will require the foreman to talk to him regarding his safety record. A second index figure will require the foreman either to transfer the employee to some other work or let him go. Since the type and frequency of first aid cases are used to compile this index, the data with which the index is set is kept confidential and is not discussed or revealed to the employees because of the danger that they would not report first aid cases if it was felt that they would be used as a gauge on safety rating in the plant. We have encouraged the reporting of first aid accidents and have insisted that they be reported. The first aid reports are the best barometer of plant safety, and if properly read and closely watched by those who are responsible for the execution of the safety program, much of the uncertainty of safety control can be eliminated.

—From an address by GEORGE J. PECARO, published in *American Mutual Magazine*, August, 1944.

Inter-American Health

MORE than 300 physicians, nurses, sanitary engineers and public health specialists from the other Americas were receiving or had completed advanced training in the United States in the 12 months ended June, 1944, under the inter-American health and sanitation program, according to the Institute of Inter-American Affairs. . . . Through the cooperative health services in the other Americas, measures for disease prevention have been accelerated and expanded on a big scale throughout the Western Hemisphere. The services have worked to control malaria around air and naval bases and in strategic centers of production and communication; have built hospitals and health centers along the more important trade and travel routes; have promoted industrial hygiene at mines, and have penetrated the sprawling Amazon jungles to serve the rubber tappers.

Cooperation

AT THE November meeting of the Industrial Hygiene Foundation in Pittsburgh, Pennsylvania, SURGEON ROBERT H. FLINN, U. S. Public Health Service, and Safety and Security Branch, U. S. Army, stated: "We have found one important item overlooked with unfortunate results in a few of the plants, and that is the matter of obtaining friendly cooperation between the plant physicians and the private physicians in the community. It is apparent that you cannot put a wall around the plant so far as medical and sanitary problems are concerned. Obviously, the employees look to their private physicians for advice on medical matters during the daily 16 hours away from their job. If the workers wishes to change or quit jobs because he thinks his work is hurting his health or if he wishes a certificate of availability under the War Manpower Commission regulations, he may seek to obtain a doctor's certificate for removal from his job. If the private physicians are wholly unfamiliar with the plant processes and health hazards, they may be in a real quandary as to the truth of the matter when their patients allege the work is injuring their health, and present real or fancied symptoms to prove their contention. In order to prevent a resulting high labor turnover from such situations, we have been emphasizing the necessity of the plant physicians establishing close cooperation with private doctors in the community. They are encouraged to visit the plant, observe the operations, and discuss the nature and methods of control of occupational diseases in the plant, and to consult with the plant doctors regarding troublesome cases. This is a practice that could well be adopted generally." It is impossible for anyone to know the full picture of industrial health without spending time in the plant where the individual works. If cooperation as outlined could be established between industries and physicians of Tennessee, a better understanding of their mutual problem would be achieved.

—*Tennessee Industrial Hygiene News*, June, 1944.

Protective
CLEANSING *for* SKILLED HANDS

TO FAVOR RECOVERY in the dermatoses, replace all harsh or irritating skin detergents with ACIDOLATE* Skin Cleanser.

1. It is a water miscible non-lathering mixture of sulfated oils.
2. It contains no soap, alkali or abrasives.
3. It quickly emulsifies cutaneous soil and facilitates its thorough removal by proper rinsing with water.
4. It emulsifies residual ointments and simplifies their removal from the hair or skin.
5. It leaves the skin feeling soft and cool.
6. Reports from ten clinics attest to its value.

★ ★ ★

Specify ACIDOLATE for use wherever soap is contra-indicated. It is supplied in 8 ounce dispenser bottles and in gallons through leading drug stores.

ACIDOLATE
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Skin Cleanser

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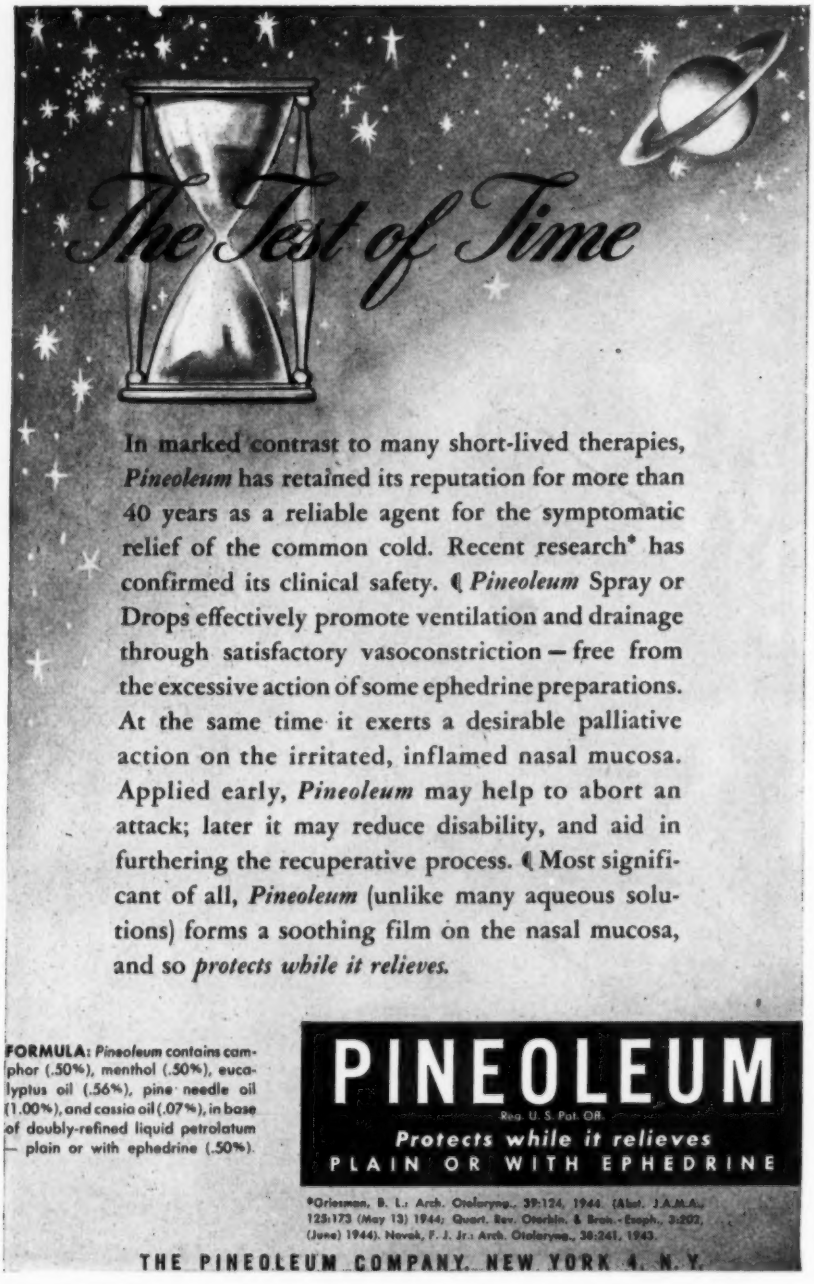
The Test of Time
In marked contrast to many short-lived therapies, *Pineoleum* has retained its reputation for more than 40 years as a reliable agent for the symptomatic relief of the common cold. Recent research* has confirmed its clinical safety. ¶ *Pineoleum* Spray or Drops effectively promote ventilation and drainage through satisfactory vasoconstriction — free from the excessive action of some ephedrine preparations. At the same time it exerts a desirable palliative action on the irritated, inflamed nasal mucosa. Applied early, *Pineoleum* may help to abort an attack; later it may reduce disability, and aid in furthering the recuperative process. ¶ Most significant of all, *Pineoleum* (unlike many aqueous solutions) forms a soothing film on the nasal mucosa, and so *protects while it relieves.*
FORMULA: Pineoleum contains camphor (.50%), menthol (.50%), eucalyptus oil (.56%), pine needle oil (1.00%), and cassia oil (.07%), in base of doubly-refined liquid petrolatum — plain or with ephedrine (.50%).
PINEOLEUM
Reg. U. S. Pat. Off.
Protects while it relieves
PLAIN OR WITH EPHEDRINE
*Griesman, B. L.: Arch. Otolaryng., 39:124, 1944. (Abst. J.A.M.A., 125:173 (May 13) 1944; Quart. Rev. Otorhin. & Bron.-Esoph., 3:202, (June) 1944). Novak, F. J. Jr.: Arch. Otolaryng., 38:241, 1943.
THE PINEOLEUM COMPANY, NEW YORK 4, N. Y.

Union Cooperation

IN Richmond, Virginia, where a special labor committee played an important part in the recent fund-raising campaign for the War and Community Fund, the local A. F. of L. newspaper published the series of seven articles on venereal diseases by Dr. Walter Clarke. Considerable interest has grown up favoring the formation of an Industrial Health Committee, as a result of a two-day Conference on industrial health held in Richmond in June under the leadership of the Richmond Community Council. . . . A VD education program for shipyard workers is being carried on in Portland, Oregon, under the leadership of David L. Piper, USPHS, working with the Oregon State Board of Health. Four large shipyards employing 85,000 workers are participating. Besides the usual pamphlets, posters, washroom cards, etc., the program features discussions of the problem in small groups, largely as part of the general training classes, on company time. Talks are given by health educators, films are shown, and discussion is so directed as to stress the advisability of blood tests and the facilities for obtaining treatment and prophylaxis. . . . SAN FRANCISCO is the headquarters of the Northern California Union Health Committee, established at the time of the Bay Area Union Health Conference in January. The Committee acts as a clearing house for material and information, and, through union committees, makes available to unions the services of medical and other organizations. Weekly health articles are released to union publications reaching 200,000 people. The following are from the Committee's *Newsletters* of August 1 and 10: "The case-finding work on the Embarcadero this week is really moving, according to everybody concerned. The Longshoremen's union is paying for the use of a Greyline bus to bring men to and from the survey. A vote of thanks goes to the business agents who have been doing the hard work of ushering men in and out of the bus. They make plans 24 hours in advance for gangs to get off. Proof of their efficiency is the testing of about 222 men a day this week. . . . " "At a meeting on Thursday, August 3d, the Joint Labor Health Council discussed with Richmond health officer Martin Mills the benefits of mass testing and possibilities of jointly conducting an x-ray chest survey in the Kaiser yards. The discussion was provoked by a report of Council representatives who had attended a meeting in Richmond, August 1, called by W. H. Roberts, of the 'Richmond War Workers Health and Welfare Committee.' At Mr. Roberts' meeting, a program for having chest x-rays given in the housing projects was outlined by Dr. Mills and Miss Ethyl Frances Murray, of the Contra Costa County Tuberculosis and Health Association. Miss Murray stated that, if the people present could secure a minimum of 2,000 signatures requesting x-rays, the Association would rent an x-ray truck and conduct the survey sometime in the fall. Peg Stein, representing the NCUHC at that meeting, described the SF waterfront testing, sponsored by unions in cooperation wtih the voluntary and public health agencies, and stated that the NCUHC could assist in the Richmond program providing the program involved union sponsorship and participation. In view of these considerations, the Joint Labor Council moved to send representatives to Mr. Roberts with the proposal that the testing be initiated in the yards by all union locals concerned. It was suggested by the Health Council and concurred in by Dr. Mills that in this way more workers would be reached, and that the participation of families in housing projects could more readily be secured following the yard testing. The Council requested that if possible the survey include VD tests. Dr. Mills agreed to consult with Miss Murray on these new proposals, following which the Health Council planned to get the approval of the AFL and CIO Councils in the area and ultimately clearance with Kaiser management and the Maritime Commission."

Vitamins in Beverages

UNTIL recently, interest in the contribution which beverages make toward the vitamin content of the average diet has been lacking. However, Drummond and Moran (*Nature* 153, *99* (*1944*), have called attention to the fact that beverages like ale, beer, and tea contain ap-

To Prevent or Eliminate Infection in *Industrial Injuries*

Azochloramid preparations have proved valuable in treating the traumatic wounds of industry as well as those encountered among our armed forces. The reduced healing time and shortened period of hospitalization effected by prompt control of infection is a welcome contribution to greater industrial efficiency. The various forms of Azochloramid provide ready adaptability to the task at hand.

For antiseptic dressings and packings that remain moist

SOLUTION OF AZOCHLORAMID IN TRIACETIN 1:500

For direct application to granulating wounds

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For lavage, wet dressings, hot soaks and compresses

SOLUTION OF SALINE MIXTURE OF AZOCHLORAMID (aqueous, prepared from powder or tablets)

and **SOLUTION OF SURFACE ACTIVE SALINE MIXTURE OF AZOCHLORAMID (aqueous, prepared from powder)**

Azochloramid preparations are *Bactericidal*

—in dilutions non-toxic to tissue

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They are the most stable of all chlorine bactericides

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QUOTED FROM INDUSTRIAL MEDICINE—

"In our plant hospital we have used the 1/500 solution in triacetin, routinely in wounds as a prophylaxis against infection. After two and one-half years of experience, we are convinced that in any raw surface, where infection is threatened, or even possible, the daily dressing by gauze moistened in the above preparation is a sure guarantee against suppuration. This insures healing per primum, and lessens both temporary and permanent disability."

Antiseptics and Their Action, R. M. Freeman: *Industrial Medicine*, February, 1940.

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COUGH... ANTIPHLOGISTINE

THE accompanying cough present in many affections of the Respiratory System is usually part of Nature's defense mechanism. The complete suppression of the cough by the use of drugs may be harmful, and yet the troublesome cough, particularly if it is associated with retrosternal tightness, or muscular, or pleuritic pain, will rob the patient of much needed rest.

The value of externally applied moist heat for the relief of these symptoms is recognized by many physicians.

ANTIPHLOGISTINE as a medicated poultice provides a convenient method for applying moist heat for prolonged periods.

ANTIPHLOGISTINE is valuable as an adjuvant in the symptomatic treatment of Bronchitis—Chest Colds—Tracheitis—Tonsilitis—Pneumonia—Pleurisy.

ANTIPHLOGISTINE maintains moist heat for many hours.

Antiphlogistine

Formula: Chemically pure Glycerine 45.000%, Iodine 0.01%, Boric Acid 0.1%, Salicylic Acid 0.02%, Oil of Wintergreen 0.002%, Oil of Peppermint 0.002%, Oil of Eucalyptus 0.002%, Kaolin Dehydrated 54.864%.

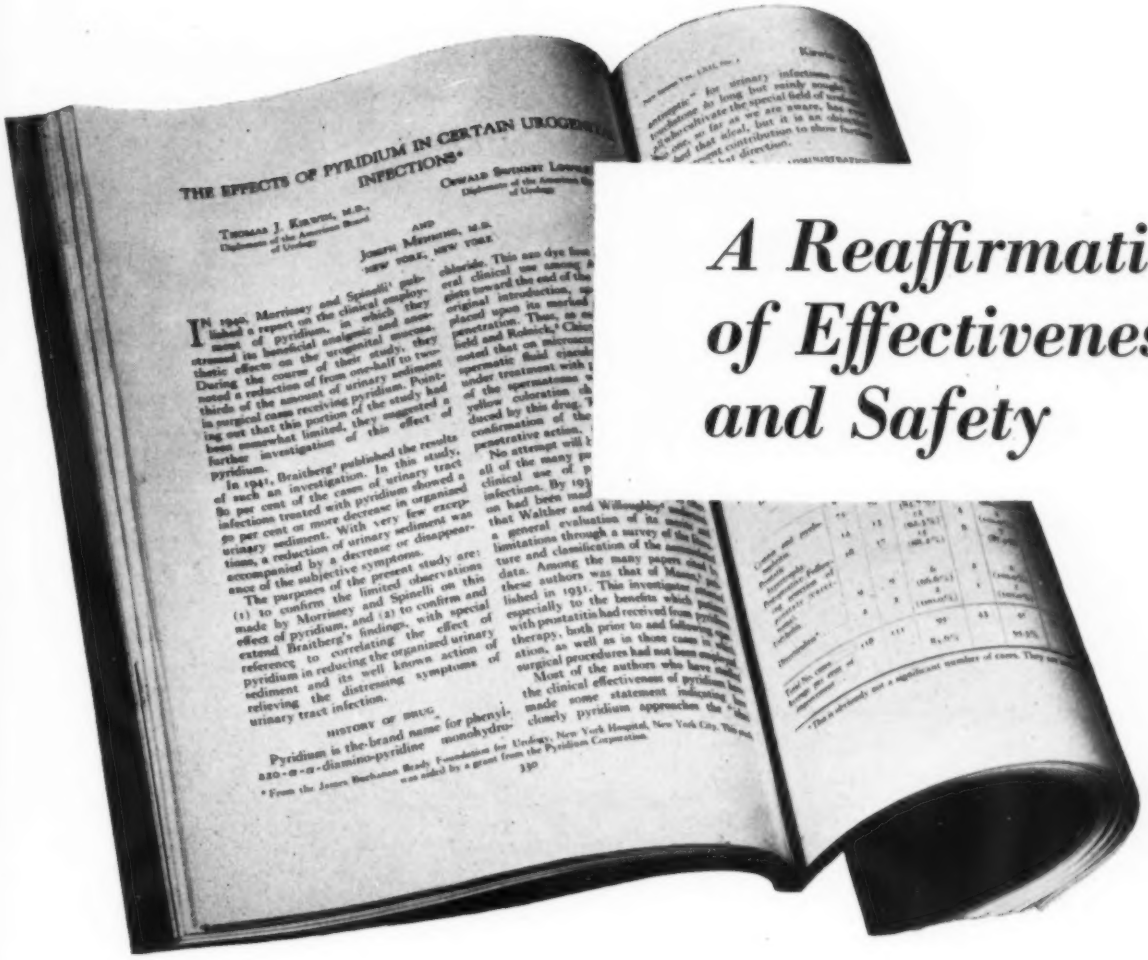
The Denver Chemical Mfg. Co., New York 13, N. Y.

preciable amounts of vitamins. The riboflavin content of beer appears to be related to the strength of the brew. Samples of malt gave values of 5.6 micrograms per gram, whereas barley showed 2.5 micrograms per gram. On the basis of one pound of barley yielding 3½ pints of beer, the authors calculated that complete extraction of the riboflavin from the malt would give a beer of approximately 1.3 mg. per liter. Actually, values for beer ranging from 0.5 to 1.7 mg. per liter have been found in the laboratories of the Cereals Research Station of the Ministry of Food and in other laboratories. Drummond and Moran found that a sample of strong ale as supplied to Queens College, Oxford, before the war gave a riboflavin figure as high as 3.9 mg. per liter. The riboflavin content decreases slowly with time. Thus, a brew of 1798 to celebrate the Battle of the Nile contained only 0.8 mg. per liter. The riboflavin was determined both by microbiologic and by biologic tests. The content of nicotinic acid in beer has been found to be as high as 15 mg. per liter. It may be of interest to know that the daily consumption of half a liter of beer of this niacin potency, an amount which was not too uncommon in certain European countries, would furnish almost 50% of the recommended daily allowance of nicotinic acid and 15 to 30% of the recommended amount of riboflavin. American observers have been struck by the rarity of deficiency conditions in Great Britain, but beer-drinking cannot provide a complete answer since abstainers do not exhibit a particular incidence of riboflavin deficiency. It is, however, well known that England is a tea-drinking country. Dr. W. H. Sebrell in this country investigated the riboflavin content of tea and found appreciable amounts (*private communication to Sir J. C. Drummond*). Drummond and Moran report that tea contains 9 micrograms riboflavin per gram, and that coffee contains 1.7 micrograms per gram. Thus, a cup of tea contains about 10 micrograms of riboflavin. Teply, Krehl, and Elvehjem reported at the Cleveland Meeting of the American Chemical Society that roasted coffee contains approximately 0.1 mg. of nicotinic acid per gram, when measured by the microbiologic assay. An analysis of coffee as dispensed in several restaurants indicated that an average cup of coffee contains about 1 mg. of nicotinic acid and studies with dogs indicated that the animal is able to utilize the material measured by the microbiologic assay. Re-examination of commercial meat extracts showed that they are rich in riboflavin and nicotinic acid. The amount of riboflavin found varied between 15.4 and 25.8 micrograms per gram and that of nicotinic acid, between 410 and 1025 micrograms per gram. A cup of these extracts would provide on the average 0.2 mg. of riboflavin and 7 mg. of nicotinic acid. The authors venture the possibility that the relatively high nicotinic acid content of meat extracts may prove to be related to their reputation as stimulants. They also emphasize that any concentration of vitamins in extracts means a corresponding poverty in corned beef. The practical importance of the results presented by Drummond and Moran are manifold. Of foremost importance, however, is the demonstration of large amounts of riboflavin and nicotinic acid in malt. The authors stress that malt products may be of considerable importance as ingredients of bread and breakfast foods.

—*Nutrition Reviews*, September, 1944.

The Railroad Journal

WE HAVE just received a complimentary copy of the *Railroad Journal*, Vol. 8, No. 12, for August, 1944. It is dedicated to American Medicine. It contains a large number of articles touching the general subject of medical care. A few of the subjects and authors are as follows: "Group Insurance for Employees," by John M. Pratt; "The American Way," by D. DeWitt



A Reaffirmation of Effectiveness and Safety

THE recent careful study conducted by Kirwin, Lowsley, and Menning, of the James Buchanan Brady Foundation for Urology, New York Hospital, and published in the December 1943 issue of *The American Journal of Surgery*, reaffirms the many previously published reports emphasizing the clinical effectiveness and complete safety of Pyridium in the symptomatic treatment of common urogenital infections.

In this study of 118 cases of common urogenital infections, routine Pyridium therapy administered for a period of two weeks produced relief of the distressing symptoms in the following percentage of cases: Pain on urination was alleviated or abolished in 95.3 per cent of the cases; burning on urination was relieved in 93.6 per cent of the cases; frequency was greatly reduced or abolished in 85 per cent of the cases; and nocturia was reduced or eliminated in 83.7 per cent of the cases.

The prompt and effective symptomatic relief provided by Pyridium is extremely gratifying to the patient suffering with distressing urinary symptoms. Gratifying also is the confidence in the physician and his therapy which is so evident among patients who are treated with Pyridium.

More than a decade of service in urogenital infections

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NEW streamlined plastic model CLINITEST *Urine-Sugar Analysis Set.* This simple, fast copper reduction test—already streamlined to eliminate heating—now takes on an added convenience for the user. All test essentials have been compactly fitted into a small, durable, Tenite plastic "Cigarette-Package Size" Kit. Write for full information.

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Clough; "The Future of Hospitals," by Graham L. Davis; "The Future of Medical Practice," by Morris Fishbein, M.D.; "The Dallas 'Experiment,'" by E. H. Cary, M.D.; "The Evolution of Blue Cross," by C. Rufus Rorem, Ph.D.; "National Viewpoint of Industrial Health," by Victor G. Heiser, M.D.; "Guest Editorial," by N. S. Davis, III, M.D.; "Good Health Is Good Business," by J. G. Searle; "Prepayment for Medical Care," by Edward H. Skinner, M.D.; "Kaiser Health Plan," by Clifford Kuh, M.D.; "Industrial Clinics and the Workers' Health," by Edward C. Holmblad, M.D.; "Medical Care Prepayment Plans," by James C. McCann, M.D.; "High Standards of Hospital Service," by M. T. MacEachern, M.D.; "Intangibles of the National Health Program," by Rev. A. M. Schwitalla, S.J. In explanation of the number, the editor, Mr. Neil Campbell, says:

"For years, we have been the voice of railroad management. In normal times we would find no reason to deviate from our editorial policy of telling railroad's story to the nation. But these are not normal times, nor have they been for several years. If, for instance, we had armed ourselves against the horizontal campaign to sell America a type of socialized medicine some several years ago, we today would not be fighting the vertical attack upon the railroads as embodied in the Wagner-Crosser bill. What portion of the public which is gullible enough to listen raptly to the theorists who live off national taxes and produce only promises of a golden dawn must be educated to the realities of the situation? As a vehicle of public education, we accept our responsibility. And as we dedicate this number to American medicine, we wonder why no other magazine has seen fit to drop its chitchat, its fiction, its trivia to face a truly important problem. We pay tribute to the brilliant authors who have filled our current issue with hard-won knowledge. We salute the National Physicians' Committee for suggesting this special issue to us. We hope that we have made a contribution." Every member of the association should obtain a copy of this particular issue of the *Railroad Journal.* We wish especially to compliment the management of this publication upon this particular production.

—Editorial, *J. Tennessee State M.A.*, September, 1944.

Regimentation

THE system of military medicine, admittedly efficient, cannot be imposed upon civilian practice without an accompanying military discipline for both patient and physician. This, in effect, was the recent reply of Dr. H. H. Shoulders, speaker of the A.M.A.'s House of Delegates to a recent "challenge" in *Medical Care* to the effect that "the very high quality of medical care which all admit is being received by the armed forces is proof that such a regimented system should be adopted by the Federal government for all the people." Dr. Shoulders pointed out that "the author failed to mention several features of the military system. He did not mention that patients are tagged and ordered to a certain institution for service, that they are required to accept whatever service is provided, and that they continue to be under military discipline even as patients. The author of the challenge attempts to carry forward the obvious deception that the medical profession can be regimented without regimenting the patients also. He who would apply a military regimen to civilian life forgets that the judgments and the skill brought to bear on the medical needs of our military forces are fundamentally the product of our civilian system of medical training and practice . . . He does not mention the numerical ratio between doctors and patients in the Army, nor does he make any reference at all to the cost of medical care under military administration."

—*Medical Economics*, August, 1944.

State Medicine in Chile

WHAT have been the results of state medicine in Chile? What do Chilean physicians themselves think about the system that has led to the gradual disappearance of private practice? On the positive side are these factors: Low income groups and families in isolated rural districts are receiving medical care they never before enjoyed. There has been an increase in the number of hospital beds. There is greater emphasis on health education. On the negative side, this is said: Physicians tend to become embroiled in political controversies. So many different benefits are provided that

FIFTY-NINE SCIENTIFIC PAPERS
LEND CONVINCING SUPPORT TO THE NEW

BIODYNE BURN THERAPY

Combines new discoveries in tissue metabolism with two widely recognized local aids... resulting in faster healing, relief of pain and decreased formation of scars and keloids.

1. BIODYNES are natural cellular products which help regulate cellular proliferation and metabolism and which offset the depressing effect of germicides on tissue respiration.

2. PETROLATUM BASE of Bio-Dyne Ointment maintains soft coagulum and minimizes crusting under which infections might develop.

3. COMPRESSION BANDAGES limit edema within the lesion and deeper substructures; maintain Bio-Dyne Ointment in contact with the lesion; markedly decrease water loss from the burned area.

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Mounting case histories from hospitals, clinics and private practice confirm the effectiveness of Biodyne Burn Therapy. Copies of case histories and a bibliography of published papers on the biodyne concept are available on request.

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A product of Sperti, Inc.
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Bio-Dyne Ointment may be secured from leading surgical supply houses in 15-oz. jars and 5-lb. jars.

THE ONLY PETROLATUM OINTMENT CONTAINING BIODYNES

NO BOILING NO MEASURING NO TEST TUBES NO BREAKAGE

Tests for Sugar and Acetone in Diabetic Urine Simplified

Acetone Test (DENCO) AND *Galatest*

Acetone Test (DENCO) detects presence or absence of acetone in urine in one minute. Color reaction is identical to that found in violet ring tests. A trace of acetone turns the powder light lavender —larger amounts to dark purple.

Galatest is the dry reagent for the immediate detection of urine sugar. If sugar is present to any pathological degree—powder turns gray or black immediately—depending on the amount of urine sugar present.

Accepted for Advertising in the Journal of the American Medical Association

SAME SIMPLE TECHNIQUE FOR BOTH TESTS

1. A Little Powder 2. A Little Urine

Color Reaction Immediately

Acetone Test (DENCO)... *Galatest*

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Handy Kit Available for Diabetic Patient or Medical Bag

Contains one vial Acetone Test (Denco), one vial of Galatest (enough in each vial for at least 100 tests), a medicine dropper and a Galatest color chart. This handy kit and refills of Acetone Test (Denco) and Galatest can be obtained at all prescription pharmacies and surgical supply houses.

administration has become unwieldy. The program, though 20 years old, has had no appreciable effect in reducing general morbidity and mortality rates. The state has won powers over medicine that may prove dangerous in the future. The cost is more than industry and the government can afford. Says Dr. Frank N. Wilson, University of Michigan medical school professor, who recently made a first-hand study of Chilean medical facilities: "Since the economic status of some of the poorer classes is very bad, some kind of government medical assistance was essential. The question is whether the present elaborate system does not threaten to bankrupt the country." Concludes Dr. Herman Romero, director of the school of Public Health of the University of Chile: "The road has been a long and tortuous one, exhaustive both of money and effort. It is questionable whether our example is worthy to be followed."

—From "Complete State Medicine in the Western Hemisphere," by C. D. ARNOLD, *in Medical Economics*, August, 1944.

Willkie on Wagner Bill

ADEQUATE medical care must be made available to all, as part of a comprehensive program of social security "to begin the moment the war is over," declared Wendell Willkie last month. But he made it plain that he did not regard the Wagner-Murray-Dingell bill as providing a satisfactory method. While this measure "contains some of the essentials of an inclusive social security program," Mr. Willkie found that "it is in many respects poorly conceived, and perpetuates the inequities of the present Wagner Act. "Taxes still fall most heavily upon the lowest paid workers, while benefits are largest to the most highly paid. Coverage is still incomplete." In demanding that adequate benefits be fixed, not according to former wages, but on the basis of regional cost of living, Mr. Willkie said this was as logical as the "decision which changed civilization" — namely, free public education for all children, "regardless of their parents' income. We have left the feeding, clothing, shelter, and medical care of our children to be determined by their parents' income alone," he declared. "It hasn't worked and can never work." As to medical care, Mr. Willkie made these recommendations: "Any plan adopted should be sufficiently flexible to allow for experimentation and growth, and the value of the practicing physician's relationship to his patient must be recognized. Adequate position must be made for building facilities where none now exist, for developing health and diagnostic centers, and for funds for research and medical education."

—*Medical Economics*, August, 1944.

Medical Leadership

WE MUST help to develop a means for assurance of medical service to those of our citizens who need it, and who cannot otherwise obtain it. This is a task that must be carried out in cooperation with our medical men. There can be no group better able to advise on medical care than the medical profession. Yet, unhappily, this is the very group which the New Deal has managed to alienate. Our free and independent medical profession has advanced medical science in America ahead of every other nation in the world. Its freedom has made it great. It should be encouraged, not discouraged. Let us enlist the leadership and aid of the doctors of America in organizing our private and public hospitals as well as our other services into a fully effective system to protect the health of all our people.

—GOVERNOR THOMAS E. DEWEY, addressing the nation from Los Angeles, September 22, 1944.

Appendectomy, 20 Shillings

PROFESSIONALLY, the doctor's position is not a happy one for the following reasons: Inspectors come around regularly to inspect his records. If these fail to pass, the doctor is fined without further process of law anything from 100 to 200 pounds. If a patient is disgruntled, he can report the doctor and the doctor is then investigated by a board, made up partly of laymen, partly of doctors. Again, the penalty is in the form of a fine, although this sort of trouble is usually squelched before it reaches a board. The fact remains, however, that a

—*Continued on page 850.*

PETROLATUM . . . prompt simple treatment to protect against burn infection . . . promote healing

Infection of burn surfaces, it is observed,[1] results largely from contamination reaching the burn surface following the injury.

In both military and civilian practise, early protection of the burn surface aims to prevent such infection, with its attendant danger of shock of toxemia, its delayed healing, added scarring.

The simpler the covering treatment, the earlier it can be effected, and the better for the patient.

With Cocoanut Grove victims a prompt simple surface treatment described as "eminently satisfactory" [1] included use of petrolatum: without debridement or cleansing, a bland ointment ("boric acid in petrolatum is safe") with protective dressing, and internal chemotherapy.

In minor industrial burns, too, observers [2] report an average smaller number of treatments and average shorter healing time with petrolatum.

'Vaseline' Petroleum Jelly (in jars or tubes) or 'Vaseline' Borated Petroleum Jelly (in tubes only) provides physicians with simple, prompt burn surface treatment.

Vaseline
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PETROLEUM JELLY

MANUFACTURED ONLY BY CHESEBROUGH MFG. CO., CONS'D, NEW YORK, N. Y.

1. Ann. of Surg. 117:885 (June) 1943.

2. J. A. M. A. 122:909 (July 31) 1943.

CURRENT ARTICLES of QUALITY

The Fractured Carpal Scaphoid

LIEUT. COMMANDER M. G. HENRY, M.D., F.A.C.S. (MC) U.S.N.R., "The Fractured Carpal Scaphoid in Industry and in the Military Service," in *The Military Surgeon*, September, 1944. Conclusions: "(1) This survey shows a comparison between the fractured scaphoid in industry and in this large military naval base. Fractures of the carpal scaphoid are the most frequently missed in diagnosis of all wrist injuries and, therefore, are the most neglected. This type of fracture constitutes a most serious industrial as well as military problem. (2) All severe sprains of the wrist, and even mild sprains, if they do not show progress within a week, should be x-rayed. (3) A definite technique in taking x-rays should be employed, namely the forcing of the hand in extreme ulnar deviation at the wrist joint. This procedure throws the scaphoid out to clear view. Many cases of fractured scaphoids are overlooked or missed because this one principle in technique is not followed in taking a picture. (4) Complete fracture through the middle to inner third of the scaphoid with any *degree of displacement* should always be treated by complete excision, after clinical swelling has subsided. We state this because usually fractures of the middle to inner third affect to some degree the nutrient arteries, and since the circulation is already poor, any impairment of this circulation is exceedingly detrimental to firm, bony union. (5) In fractures involving the scaphoid bone where there is merely a fracture line, and where the fragments of bone are in good apposition, with no displacement or dislocation and little, if any, comminution, then the treatment is entirely conservative, consisting of immobilization, diathermy, whirlpool baths and passive and active motion. (6) Where there is any serious comminution of the scaphoid, if such comminution involves—as it usually does—the outer third, we advise early surgery to clean out all the affected part, but at the same time leave entirely unmolested the main bone structure. (7) Any dislocation of the scaphoid we believe should be treated by total excision of the bone. (8) Pain and weakness on gripping, as well as local pain on dorsi flexion, indicate pathology in the scaphoid. (9) Any crushing together of the scaphoid should be treated by complete removal of the bone. From our study let us remember that this fractured scaphoid is a most commonly misdiagnosed condition, and that many a so-called sprained wrist or sprained fracture is actually a well-developed fracture and only too often a fractured scaphoid with non-union, because normal circulation to the bone is poor. (10) It is noted that in the five year industrial survey that there was an incidence of 25% non-union in fractured scaphoids while in a large military base with more cases to report there was a close comparison in that 32% showed non-union."

In a Shipyard

ROBERT L. BROWN, M.D., Brunswick, Georgia, "Medical Conservation of Manpower in a shipyard," in *J. Med. A. Georgia*, July, 1944 (33:7, 208-213). Extract: "Medical conservation of manpower in a shipyard means utilizing every available man and keeping the lost time from injury and illness at a minimum. Technics which have contributed to this end at the Brunswick Shipyard of the J. A. Jones Construction Company, Inc., will be briefly described. An important role is played by the pre-employment examination. In a large industry it is possible to find a place for nearly everyone who wishes to work. Our examining department is located in the employment building directly across the hall from the interviewers who assign applicants to various jobs. This proximity to the interviewers greatly facilitates the process of changing a prospective employee from one job for which he is not physically qualified to one which he can do without risk of harm to himself or his fellow workers. Applicants fill out and sign the part of the examination card relative to their past medical history while waiting to enter the examination room. They then enter the medical examination section where a nurse checks vision, hearing, blood pressure, weight, nose, throat and teeth. Findings are recorded by a clerk. Another nurse then takes a blood specimen for a Kahn test. We use Keidel tubes for this purpose and find them very satis-

"Total" Therapy

FOR INDUSTRIAL DERMATITIS

"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area—because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

With tissue repair under way, and only erythema remaining, the use of **Domeboro Ointment** (each ounce of which, in a special hydrophilic base, possesses the therapeutic action of one Domeboro Tab diluted in a pint of water), permits a quicker return to work, while healing is promoted by its efficient topical action.

(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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Canadian Distributor: F. J. Whitlow & Co., Ltd., 165 Dufferin Street, Toronto, Ont., Canada

"PHYSIOLOGIC DEBRIDEMENT"
plus
ANTIBACTERIAL ACTION

The efficacy of topical applications of Sulfathiazole for the treatment of a wide variety of localized infections is generally recognized.

The combination of Sulfathiazole with urea possesses distinct advantages. Urea exerts a solvent action on protein matter, thus aiding the removal of debris, pus and incrustations. Due to this cleansing effect ("physiologic debridement"), healing is greatly encouraged. Moreover, with the dissolution of necrotic tissue and the lysis of bacteria, inhibitors to the sulfonamides are removed. Hence, sulfathiazole can exert its full antibacterial effect.

INDICATIONS

For topical infections due to staphylococcus, streptococcus and other organisms — impetigo contagiosa, superficial folliculitis, intertrigo, secondary infections associated with various dermatoses and fungus infections, minor surgical conditions, etc.

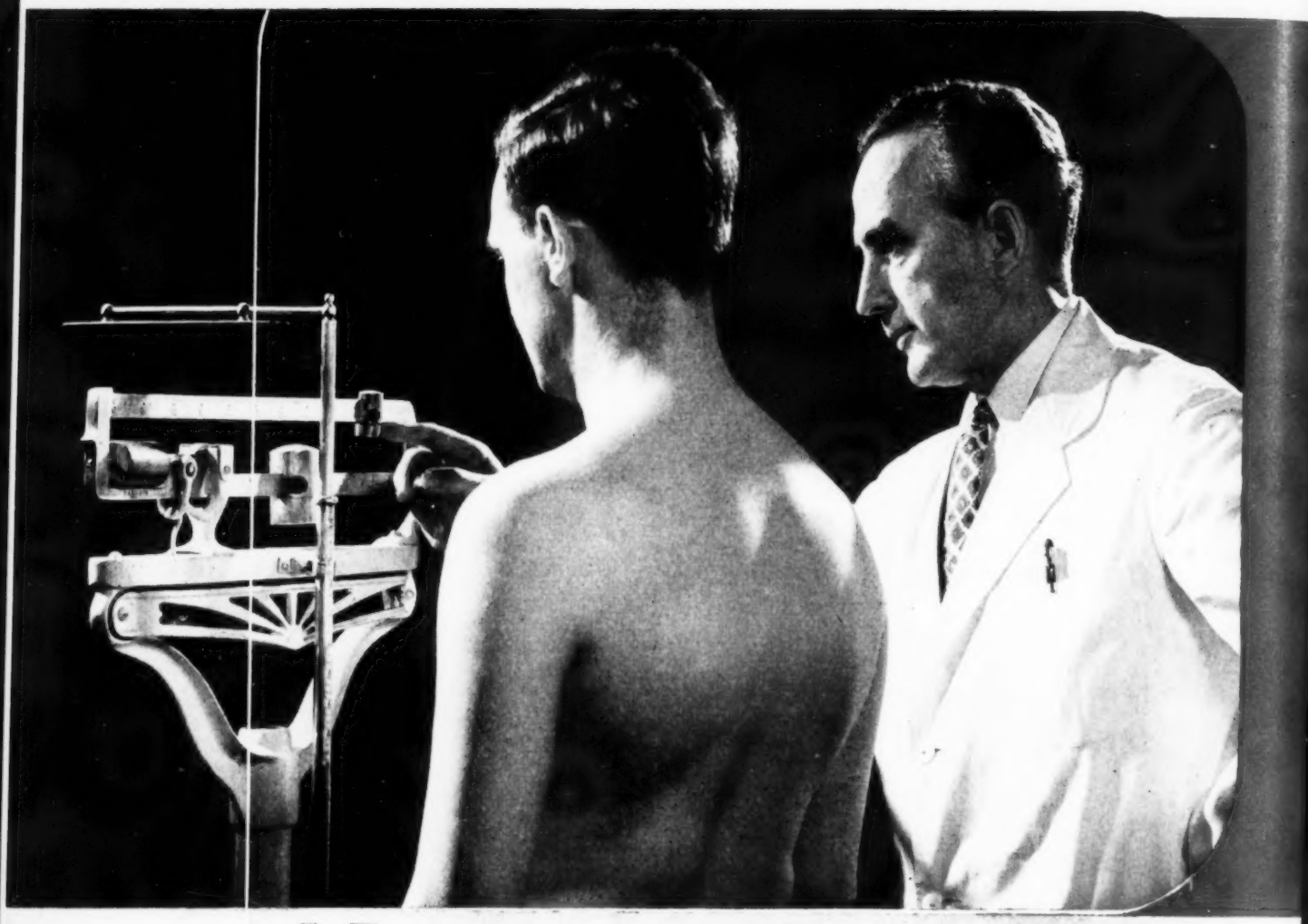
Supplied in 1 ounce tubes

Sulfathiazole-Urea Ointment contains 5 per cent Sulfathiazole and 30 per cent urea in an oxycholesterol-petrolatum base.

SULFATHIAZOLE-UREA OINTMENT WINTHROP

WINTHROP CHEMICAL COMPANY, INC.

NEW YORK 13, N. Y. *Pharmaceuticals of merit for the physician* WINDSOR, ONT.



Measuring results in arthritis therapy

Weight gain in a previously anorectic patient with arthritis is one of the measurable results in Ertron therapy.

This is a systemic response to treatment which cannot be accomplished with analgesic medication.

Such objective evidence as weight gain, increased muscular strength as measured by the grip dynamometer, diminished joint size, and cinematographically recorded increase in motion is thoroughly in accord with present standards of success in the treatment of arthritis.

The Ertronized patient *feels* better and *is* better.

ERTRON

ERTRONIZE THE ARTHRITIC

ERTRONIZE MEANS: Employ Ertron in adequate dosage over a sufficiently long period to produce beneficial results. Gradually increase the dosage to that recommended or to the toleration level. Maintain this dosage until maximum improvement occurs.

ERTRON* alone—and no other product—contains electrically activated, vaporized ergosterol (Whittier Process).

Supplied in bottles of 50, 100 and 500 capsules.

ETHICALLY PROMOTED

*Reg. U. S. Pat. Off.

NUTRITION RESEARCH LABORATORIES
CHICAGO

ERTRON Parenteral

For the physician who wishes to supplement the routine oral administration of Ertron by parenteral injections, Ertron Parenteral is available in packages of six 1 cc. ampules. Each ampule contains 500,000 U.S.P. units of electrically activated vaporized ergosterol (Whittier Process).

FOR FIRST-AID TREATMENT ------ For FOLLOW-UP AFTER-CARE

GADOMENT
(PATCH)

has proved its value in the treatment of burns, ulcers, wounds and certain types of skin conditions.

Gadoment is a bland cod liver oil ointment which spreads easily, promotes healing and does not seep through dressings.

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Box 247, Montreal, Quebec

THE E. L. PATCH COMPANY
BOSTON, MASS.

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TRADE MARK REG. U. S. PAT. OFF.

Sanitary Sheeting

has an absorbent cellulose front and waterproof back. It is excellent for use in home as well as in hospitals, with invalids, infants or incontinents. Supplied in 36″ rolls and various sized sheets, it is economical, disposable, luxurious in appearance.

FIBREDOWN is also made without backing to provide as inexpensive a material as possible.

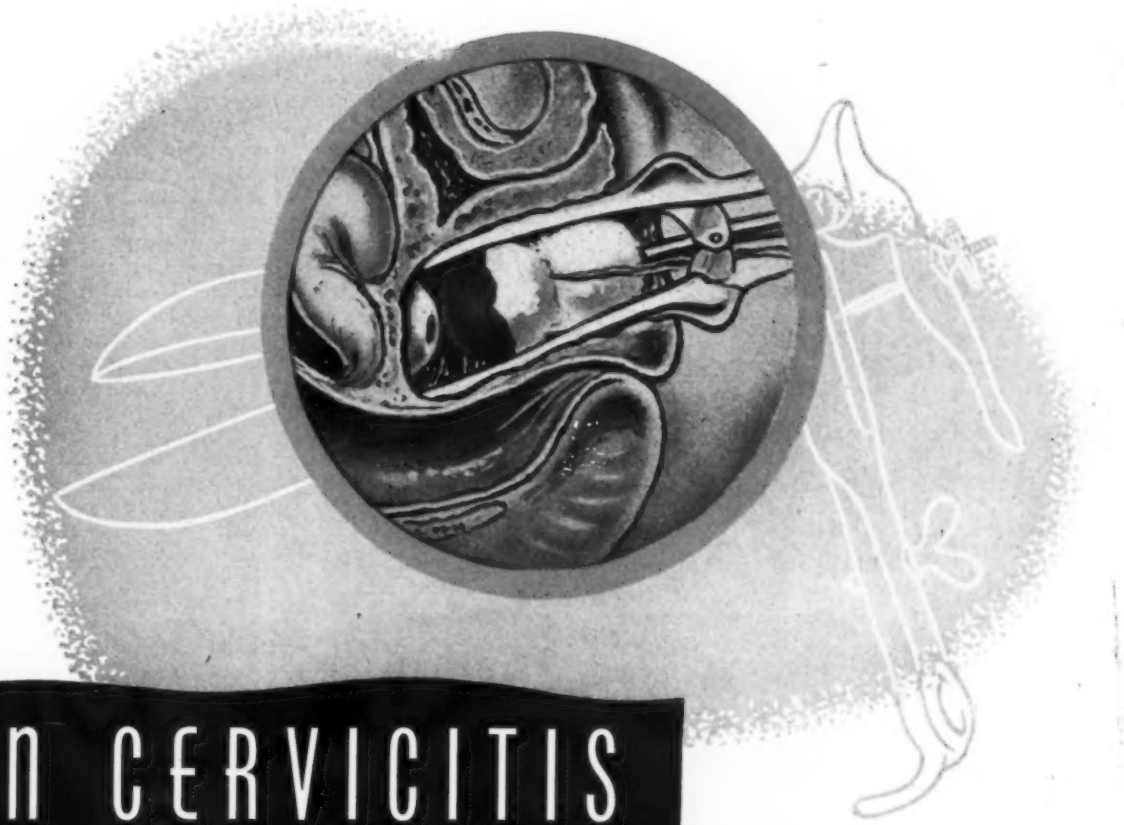
Due to conditions beyond our control, we are not always in position to supply all items shown on our price lists or advertised therein...

Product of
THE GENERAL CELLULOSE CO., Inc.
GARWOOD, NEW JERSEY
Member, American Surgical Trade Assn., Hospital Industries Assn. and Nat'l Assn. of Mfrs.

factory. The applicant then takes his examination card and enters one of the three dressing rooms. When called by the examining physician he enters his office where heart, lungs, abdomen and extremities are checked, examination for hernia carried out, and physical status evaluated and classified. The applicant is placed in one of four groups. Class 1—no defects. Class 2—minor physical defects present but applicant physically able to do any work on the yard. Class 3—major defects present but applicant physically qualified for some particular job. His record must be reviewed by the examining physician before he can be transferred to any other work. Class 4—physically unable to perform any work on the yard. The examining physician then checks the employment slip for the job for which applicant is slated and if he finds that it does not fit the applicant's physical qualifications, he contacts the interviewer who made the assignment and a change is worked out. The examining physician also fills out a form on all Class 3 cases which states the nature of the defect. One copy is sent to the employee's supervisor, another is clipped to his personnel record and a third is kept in the medical department. If the prospective employee is to be restricted to ground duty the examining physician makes a notation to this effect on the applicant's employment slip. We established our criteria for replacement by first learning as much as we could about what each job entailed and then outlining the physical requirements with the aid of the heads of the various departments concerned, the safety engineer, and the personnel director. It is better to base requirements on conditions actually known to be present in your own yard rather than to follow those which someone has found helpful in some other yard or industry. To keep in touch with changing conditions our examining physician spends one afternoon a week, whenever possible, familiarizing himself with operations and checking up on the performance of handicapped individuals. With the set-up just described and with the aid of two nurses and two clerks, one physician was able to examine 3,438 applicants, during the month of April, 1943, the highest daily total being 196. This was done without resorting to mass examinations."

Back to Work

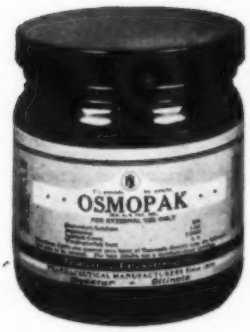
W. A. SMITH, Delco-Remy Division, General Motors, Anderson, Indiana, "Puting the Veteran Back to Work," presented at the Second Annual Industrial Health Conference of Indiana State Medical Association, Indianapolis, April 20; published in *J. Indiana State M. A.*, June, 1944 (37:6, 282-289). Extracts: "The medical examination and classification by the plant physician is of greatest importance in the placement of the veteran. This is particularly true because of our inability to obtain detailed medical history from the armed services relating to the discharge. In many cases the information given to the veteran, as to the reason for his discharge, is entirely refuted by medical examination. It presents a particular problem with the psychoneurotics, as they are extremely difficult to spot, and, in cases where the reason for a discharge is given as nervousness or emotional instability the physician is without background for an accurate analysis of the seriousness of the mental disturbance. As an illustration, we have the case of E. S. —31 years old—married. He served 10 months in the Army and was given a medical discharge for nervousness on February 20, 1944. He had spent two months in an Army hospital prior to being released. He hired in as a core assembler. After six weeks in the foundry, he found that his nervous condition was returning due to noise. Investigation proved that he had been of a nervous temperament before entering the service, and this condition had been accentuated by military training. He had applied for, and is currently receiving, 10% disability benefits from the government on this basis. We transferred him to a job where there is less noise, and he is doing satisfactory work. His medical classification has been changed so that he will be restricted to noise-free areas in the future. While no



IN CERVICITIS
THE COURSE IS DEPLETION

It was Meaker[1] who said, "In many cases, notably those of endocervicitis and mild salpingitis, a course of depletion may result in a permanent cure - - -"

OSMOPAK when applied by tampon to the inflamed cervix, produces a profound osmotic pressure, depletes edema and localizes infection. Kleine[2] in a report of 100 cases, found OSMOPAK additionally of value after cauterization. The immediate use of OSMOPAK seemed to localize the reaction, lessen the discomfort to the patient, and definitely gave a quicker and cleaner healing.



OSMOPAK presents a soft colloidal jel of Magnesium Sulfate, Benzocaine and Brilliant Green - - - assures a desired course of depletion.

SUPPLY: 1½ lb. jars.

1. Meaker, S. R., Gonorrhea, J.A.M.A., 87:1377(1926)
2. Kleine, H. L., Cervicitis, J. Mo. State. M.A., April 1939.

OSMOPAK
REG. U. S. PAT. OFF.

IRWIN, NEISLER & COMPANY SINCE 1886 DECATUR, ILLINOIS

harm occurred in this case, if we could have had the benefit of the man's medical history this man could have been placed in a noise-free area immediately. While it is supposedly possible to get this information upon the approval of the veteran through the medium of a signed waiver authorizing the government to turn it over to us, our experience has been that it takes so long to get it and that when it is obtained it is of such meager content as to be of little or no value. For our part, we have just about given up any attempt to secure medical histories and rely entirely upon our physicians. . . . The second classification is that group of individuals who have been discharged because they are tempermentally unsuited for military service. This is the group who are emotionally unstable, and in the vast majority of these cases these characteristics were not acquired in the service but are inherent. It is extremely difficult to recognize this type upon their return because in many instances they have not been told themselves the real reason for discharge, and their discharge papers do not give us the necessary information. This is the type of individual who makes the most fuss about being a veteran; he demands preferential treatment; he has alleged back injuries and can not do any lifting; he has calcified glands in his chest and objects to working in any dusty environment; he has an alleged heart condition and must do extremely light work; or he has defective feet and must sit down. He is the 'misfit' and generally you will find that he was a 'misfit' in society before he entered the service. The problem with this type of individual was acute before the war, and now that he has the word 'veteran' connected with him he represents even a greater problem, and is our greatest one to date. Actually they do not represent an authentic rehabilitation program any more than do those returning with ulcers, flat feet, hernias, or other non-service disabilities. Not only do they present a problem in proper placement, but they represent a very grave danger to the entire program unless carefully guarded against, because being constantly in the eyes of supervision they gradually will result in all veterans being considered in the same light. Our thinking with regard to this group is that we do owe them a fair chance to a place in industry, and that we will go even further with them than we would with the ordinary employee. In other words, we are obligated to give them a reasonable opportunity, but their rehabilitation is not basically industry's responsibility; it is the responsibility of society as a whole. A good example of this type of individual is the case of E. M. A. He served seven months. Single—46 years old—was hired March 27, 1943, after discharge from the Marines at his own request to accept employment in an essential industry. On April 16, 1943, he reported to the medical department, complaining of vertigo and general nervousness—medical examination did not reveal any pathological condition. Discussion with his supervisors showed that he had been a constant source of trouble in his department. He wore his uniform (or parts of it) to work regularly, and talked to other employees about his having been in the service; therefore was entitled to special privileges. He was tried on a number of light assembly jobs, being given a much longer break-in period than is given regular employees. He was moved to another plant to give him a fresh start under different supervision and a different type of work—all failed. This entire period was punctuated by frequent trips to the hospital. A complete investigation was then carried out, and it was found that before he went into the Marines the same conditions had existed—he had never done satisfactory work. In other words, we had on our hands a 'misfit'—a man who had never been a normal individual before entering the service and who was using his few months of military service as a basis for holding his job. We finally have placed him as a sweeper, and he has been told quite frankly that if he does not do this job we can offer him nothing further. Incidentally, this case is an example of another problem with which industry will be faced—that of pressure groups. At the time this man was transferred from inspection to janitor work, the union filed a grievance which said, in effect, that we were being unfair to this ex-marine in transferring him to a lower-paid classification—the inference being that here was a division of General Motors which was not taking care of a veteran. Such a grievance, though it has no basis in fact, is most dangerous."

Rx DESITIN OINTMENT

The External Cod-Liver Oil Therapy

USED EFFECTIVELY IN THE TREATMENT OF

Wounds, Burns, Ulcers, especially of the Leg, Intertrigo, Eczema, Tropical Ulcer, also in the Care of Infants

Desitin Ointment contains Cod-Liver Oil, Zinc Oxide, Petrolatum, Lanum and Talcum. The Cod-Liver Oil, subjected to a special treatment which produces *stabilization* of the Vitamins A and D and of the unsaturated fatty acids, forms the active constituent of the Desitin Preparations. The first among cod-liver oil products to possess unlimited keeping qualities, Desitin, in its various combinations, has rapidly gained prominence in all parts of the globe.

Desitin Ointment is absolutely non-irritant; it acts as an antiphlogistic, allays pain and itching; it stimulates granulation, favors epithelialisation and smooth cicatrisation. Under a Desitin dressing, necrotic tissue is quickly cast off; the dressing does not adhere to the wound and may therefore be changed without causing pain and without interfering with granulations already formed; it is not liquefied by the heat of the body nor in any way decomposed by wound secretions, urine, exudation or excrements.

DESITIN POWDER

Indications: Minor Burns, Exanthema, Dermatitis, Care of Infants, Care of the Feet, Massage and Sport purposes.

Desitin Powder is saturated with cod-liver oil and does not therefore deprive the skin of its natural fat as dusting powders commonly do. Desitin Powder contains Cod-Liver Oil, (with the maximum amounts of Vitamins and unsaturated fatty acids) Zinc Oxide and Talcum.

Professional literature and samples for Physicians' trial will be gladly sent upon request.

Sole Manufacturer and Distributor in U. S. A.

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Two additional new developments to aid electro-medical diagnosis and treatment —
by the Electro-Physical Laboratories, Inc.

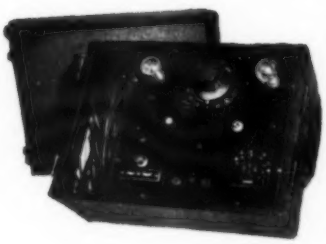
EPL Electro-Encephalographs

MODEL PE-2 . . .
a two-channel portable machine.

Available in stationary form in any number of channels, such as Model SE-6 shown here.

Both of these electro-encephalographs operate efficiently in most locations without the use of a shielded room. The results achieved are equal to those obtained by any permanently installed instrument utilizing a shielded room. This is true even at ten microvolt sensitivity, with multi-channel bi-polar connections. In the portable models, all connecting cables, electrode leads, and other necessary accessories can be carried in both boxes, and by one man. Box size . . . 13″ x 13″ x 12″. Weight of amplifier box . . . 30 pounds. Weight of writer box . . . 38 pounds. The stable amplifier, of straightforward design, radically reduces interference, and permits the taking of encephalograms in heretofore impossible locations. New methods in ink or inkless writing (as preferred) and other electro-mechanical features make for new ease and reliability of operation.

EPL Electric Shock Machines



Devoid of all unnecessary control knobs or meters. A newly developed timing circuit provides shock current durations over an unusually wide range . . . .1 to .6 seconds in standard models, and up to 4 seconds on special order. This circuit holds its adjustment regardless of the voltage of the power supply line. **Light in weight . . . 10 pounds. Small in size . . . 12½″ wide x 9½″ high x 7″ deep.**

More detailed information about all EPL electro-medical developments—Electrocardiographs, Electro-Encephalographs and Electric Shock Machines — will be forwarded to you upon request. Address, Dept. . . E-10

Electro-Physical Laboratories, Inc.
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a division of the ELECTRONIC CORPORATION OF AMERICA

Laboratory Accuracy
...in the bag

The KOMPAK Model

Were it feasible to transport the most complex laboratory equipment to the bedside to insure accurate bloodpressure readings, no greater accuracy could be attained than is consistently possible with a Lifetime Baumanometer. This fact logically explains the universal acceptance of the KOMPAK Model as an instrument unexcelled for routine office and bedside use.

Physicians demand the degree of accuracy inherent in the Baumanometer. They appreciate the time-saving, trouble-free character of its functional design. Equally important—the advantages afforded by its simplicity of operation and micrometric compactness are highly regarded. In the office, Baumanometer dependability is indispensable . . . on out-calls, these laboratory qualities are ever IN THE BAG.

*Get the **FACTS** and you will buy a Lifetime Baumanometer*

Lifetime Baumanometer
STANDARD FOR BLOODPRESSURE

W. A. BAUM CO. INC. NEW YORK

ORIGINATORS AND MAKERS OF BLOODPRESSURE APPARATUS EXCLUSIVELY

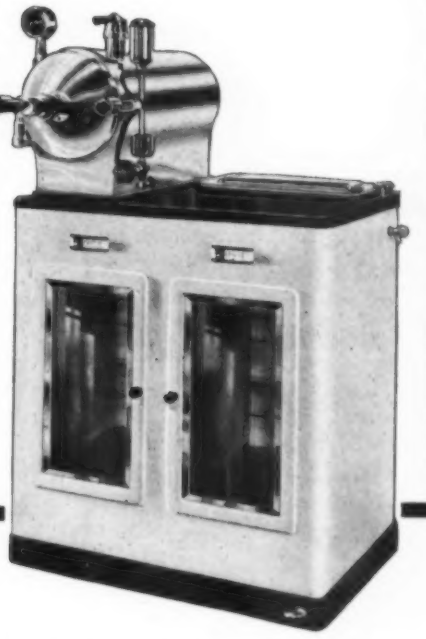
Access to Top Management

WILLIAM J. FULTON, M.D., Medical Director, Eastern Aircraft-Baltimore Division, General Motors Corporation, "Medical Service in Industry," presented at the War Session A.C.S., Baltimore, March 24; published in *Bulletin of the American College of Surgeons, War Issue*, June, 1944 (29:2, 192-195). Extract: "The doctor's time should be planned to cover the greatest number of employees during their working hours. In a factory working more than one shift and served by a lone physician, this is especially important. Rotating shifts have increased the efficiency of health supervision, since it brings the physician in more frequent contact with all of the employees. When employees are in fixed shifts, the physician's time will be of more widespread value if his hours rotate and overlap the shifts. Full-time industrial physicians should have direct access to top management. Relaying medical matters through intermediaries is worse than the occasional practice of some physicians who transmit medical messages verbally by way of their patients. The first business of medicine in industry today is the appraisal of the human tools at pre-employment physical examination, to insure their placement in occupations that are safe for them to perform and for which they are physically qualified. Not only is the initial placement important, but a procedure that follows the employee throughout his employment is even more important if he is to be guarded against transfers that are not in keeping with his physical and mental qualifications. All this requires cooperative teamwork with employment, labor relation, safety, production, and other departments. Such a procedure should reach the employee through the foreman. The establishment of such a procedure consists of three elements: (1) every job in the factory is listed by number; (2) the medical department classifies by number and description various physical disabilities together with the occupations these disabilities contraindicate, examples of such occupations being, for instance, no work above ground level, no exposure to high temperatures, or no exposure to high dust concentrations or irritating fumes; (3) opposite each medical classification are placed the numbers assigned to the jobs on the job listing (first element) on which an employee with this medical classification is *not to be placed*. This information should at all times be available to industrial supervision. Changes in the physical status of any individual employee should be immediately registered on this key list. The present-day employment of large numbers of women and physically substandard men, plus the employment and rehabilitation of increasing numbers of war casualties, is in need of some such procedure."

Drugs on the Market

AUSTIN E. SMITH, M.D., Secretary, A.M.A. Council on Pharmacy and Chemistry, "Drugs on the Market," in *J. Tennessee M. A.*, September, 1944 (37:9, 299-305). Extract: "Contributions to the drugs that are now on the market have been made by many professions, many business enterprises, and many educational centers. The ten largest United States pharmaceutical houses spend over $10,000,000 each year for research. Foundations, hospitals, and universities contribute enormous sums or the equal by virtue of supplies, equipment, personnel, and time. The guiding influence has been the need of the physician and, of course, the public. Such need may be estimated when we stop to realize that sulfonamides are produced at the rate of ten million pounds per year; aspirin 8,500,000 pounds; phenobarbital, 300,000 pounds; quinacrine (atabrine), 550,000 pounds; 1,250 tons of synthetic vitamins (for example, 75,000 pounds of riboflavin and 160,000 pounds of nicotinic acid amide); vitamin A, 138,000,000,000,000 units; and penicillin, hundreds of billions of units. The total sales of all drugs during 1943 is unknown by the writer at the moment, but he is aware that over 230,000,000 prescriptions were issued. The need for careful examination of the drugs on the market is evident. The development of a new agent is almost always attended with enthusiasm and enthusiastic claims. Often honest differences of opinion exist between investigating physicians over the effectiveness of a compound. Is it surprising then that the manufacturer should reflect this enthusiasm since successful existence in the business world depends upon the sale of such agents? The Food and Drug Administration since 1938 has not permitted new compounds to be sold

Is Your Hospital and First Aid Equipment Adequate?

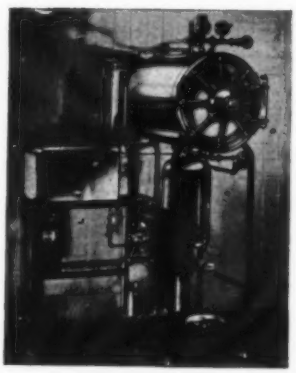


Are your Sterilizers up-to-date? Have they ample capacity for today's job? Are they efficient? Completely safe? How about operating lights? A really good light speeds the Doctor's work.

CASUALTIES on the production line today can be as costly as casualties in the field.

The responsibility of preventing any production let-down is in your hands. With plant personnel doubled or tripled, your present equipment may not be adequate for the job. Under any conditions, the chances are that you have a definite need for Castle Industrial Sterilizing Equipment and for Castle Lights.

Wire us the approximate number of cases handled daily by your First Aid Department. Let us recommend adequate equipment. We can make good deliveries on high priority orders.



Castle Sterilizers range in size from the smallest portable electric 16" boiler to a battery for a city hospital. Standardized unit for various size plants are available.

CASTLE 669—*For the industrial physician's office*

Has 8" x 16" autoclave with CAST-IN-BRONZE construction. Entire body, ends and base cast in one piece of lifetime bronze. Recessed 16" CAST-IN-BRONZE Instrument Sterilizer with silent oil-check foot lift. 9" x 20" black porcelain finished table top. Spacious double cabinet with plate glass doors and shelves. "Full-Automatic" throughout.

CASTLE LIGHTS

Castle No. 1 Spotlight provides ample, cool, color-corrected, glareless, shadow-free light wherever it is needed most. Although operator's head may be held directly in front of light, a complete spot of illumination will still be projected. Unexcelled for locating foreign bodies in the eye. Completely adjustable, on tripod caster base or wall mounting. Other Castle Lights include Major Operating Lights. Lights for Improved Over-All Illumination and Emergency Power Units.

CASTLE 1150

Combines 16" x 20" Pressure Dressing and Utensil Sterilizer, 3 gal. Pressure Water Sterilizer, 3 qt. Water Still, and 17" Instrument Sterilizer with foot pad lift. Affords full hospital sterilization in one compact, efficient unit.

WILMOT CASTLE COMPANY

1161 University Avenue, Rochester, N. Y.

The A-B-C of SERATURE WOUND CLIP *Superiority*

A IDENTIFYING "SPURS": After primary insertion, compression of spurs permit further adjustment for pressure and position to insure a more accurate wound closure. Only a single forceps is required to painlessly and quickly remove the clip with minimum tissue damage.

B DOUBLY REINFORCED: The twofold reinforcement of the clip provides greater bending strength and dependable security in situ.

C INTEGRAL REINFORCEMENT: Effects bend at exact center of clip thus insuring accurate alignment of teeth. When removal is made by simple compression of spurs, clips remain intact for repeated use.

Your dealer can supply you

PROPPER MANUFACTURING CO.
10-34 44th Drive
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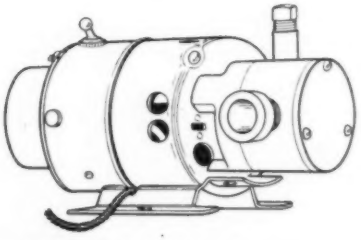
SERATURE WOUND CLIPS made of finest 18% non-corrosive nickel silver are available in 12, 14, 16, 18 mm. sizes in units of 1000, 100 and 40 clips.

For AIR SAMPLING



The JORDAN Volume Pump

This compact, 3½ lb. Jordan Pump displaces 7 cubic feet of free air—or 5 cubic feet against 2″ of vacuum. So sensational is its performance that we will send it to you on ten day free trial, expenses collect.

In black enamel finish, equipped with sealed ball-bearing motor that requires no lubrication—toggle switch—and six feet of Belden Twin Cord. Positively guaranteed for *two years* against mechanical defects.

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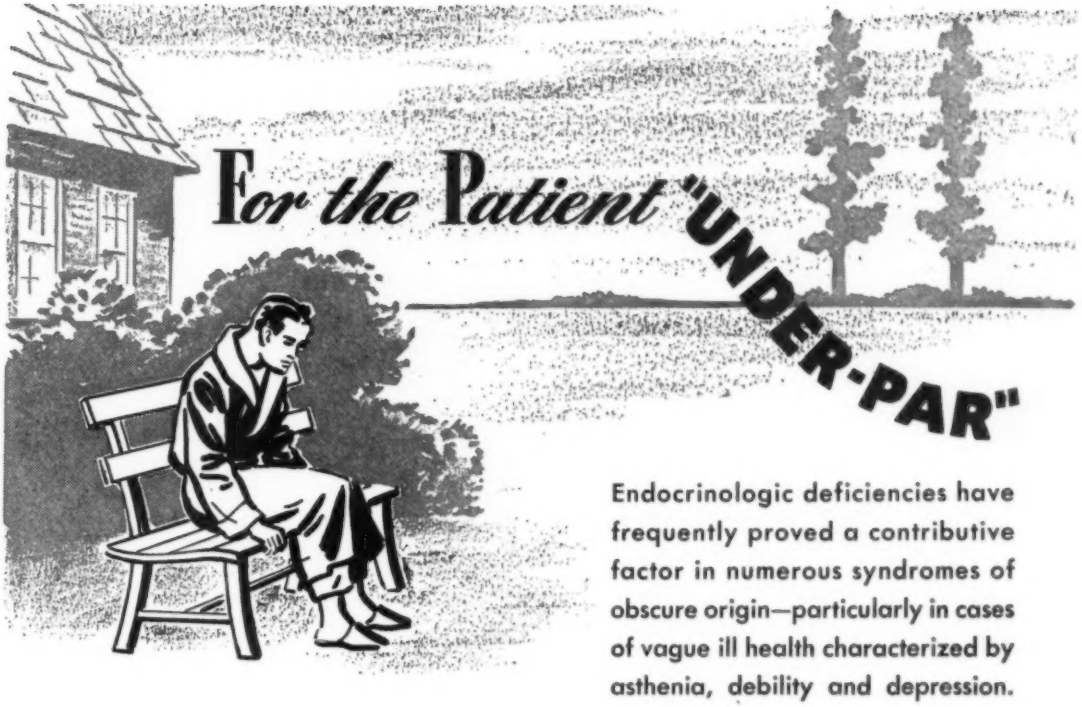
JORDAN PUMP COMPANY

2004 Bryant Bldg. Kansas City, Missouri

in interstate commerce unless they are safe for use and bear adequate labelling, which includes proper warnings. The body that has been foremost in attempting to assure truthfulness in advertising claims for preparations used by the physicians has been the Council on Pharmacy and Chemistry. This agency, like all other councils and bureaus of the American Medical Association, is yours. It is part of the medical profession. It operates under a grant from the Board of Trustees and has absolutely no commercial dependence on any manufacturer. The council accepts no remuneration for its consideration of agents for inclusion in New and Nonofficial Remedies. The council has been in operation for forty years, and so long as drugs are advertised with claims there will be a need for its continued existence; it can never be expected that all drugs will be sold with only recognized claims. The council's history and activities were reviewed in the February 12 issue of the *Journal of the American Medical Association* and it is unnecessary to go into detail at this time. Nevertheless, it is important for the medical profession to know that its association maintains such bodies which give freely of their time to promote rational therapeutics, and that these bodies welcome inquiries from physicians. Not only do they welcome inquiries, but they are glad to receive suggestions and each suggestion will be given immediate attention. I sincerely hope that every member of this audience will make more and more use of the councils and bureaus which have been established at the headquarters of the American Medical Association, not only because these offices can provide information, but because they are your councils and your bureaus, and as such you should take just as much interest in them as if they were your bonds or savings accounts."

Detroit Plan

WAYNE COUNTY Medical Society's Industrial Health Committee (C. K. HASLEY, M.D., and F. T. MCCORMICK, M.D., co-chairmen) have sent all members of the Society a postcard questionnaire requesting cooperation in the "Health Program for Small Industries (Detroit Plan)," described in *Detroit Medical News* for August 14, 1944, as follows: "Medical service in small industries has been much discussed by health groups in recent years. Strangely enough, however, the health and safety of workers in small plants have by no means improved commensurate with the advance of modern medicine and the growth of available health agencies. Larger plants are able to provide, within their own organizations, a health department to deal adequately with sickness and accident. As a result, the percentage of absenteeism and loss of work hours has markedly decreased. Is it not possible to initiate a similar program for smaller industrial organizations? Physicians, nurses, and public health groups are eager to cooperate to bring this about, and with little added cost to management. The following letter outlines a simple plan which any industrial organization may adopt. It is a start for better health for the war worker. When a sufficient number of doctors have notified the society of their availability for these services, this letter will be sent to a selected list of industries in Metropolitan Detroit employing 25 to 1,000 men who do not have a full-time plant physician. The Wayne County Medical Society offers its fullest cooperation. 'The Blank Manufacturing Co., Detroit, Michigan: Conservation of manpower is essential to Victory. The battle of production on our industrial front requires maximum efficiency from every worker. Today there are many factors restricting this efficiency, notably high loss of production time through absence from the job. Careful analysis indicates that a large percentage of absenteeism is due to physical disabilities. Much of this can be prevented by a better industrial health program in the plant itself—better coordination with health agencies—more careful investigation of the causes, prevention and treatment of sickness and accident. The Wayne County Medical Society and the Department of Public Health desire to



Endocrinologic deficiencies have frequently proved a contributive factor in numerous syndromes of obscure origin—particularly in cases of vague ill health characterized by asthenia, debility and depression.

PROTONUCLEIN—containing seven glandular or associated substances—has proved markedly helpful in:

1. Stimulating metabolism,
2. Compensating for glandular imbalance.

Many physicians today employ Protonuclein routinely as a reconstructive (unless thyroid is contraindicated)—to aid in the physiologic rehabilitation of the "under-par" patient, and the invalid or convalescent.

Available: In bottles of 100, 500, or 1,000 tablets.

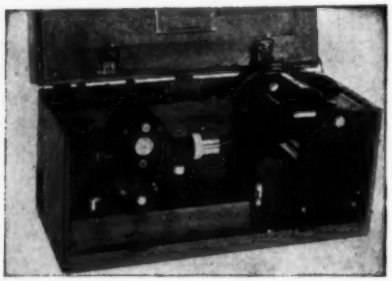
Dosage: Dependent upon thyroid requirement.

Formula: In desiccated form, each tablet contains: thyroid U.S.P., 1/14 grain; pancreas, ½ grain; spleen, ½ grain; suprarenal, ¼ grain; thymus, ¼ grain; brain, ¼ grain; lymphatic, ¼ grain.

REED & CARNRICK, JERSEY CITY 6, N. J.

PROTONUCLEIN
THE MULTIGLANDULAR PRODUCT

Many a good man's golf bag is collecting dust or is fondled occasionally at night in an imaginary game in the library. The same is true of fishing rods, tennis rackets and shot guns. Today most of us haven't the time nor the urge to play . . . to the detriment of health in general and the heart in particular.



THE "SIMPLI-TROL" PORTABLE MODEL. MOBILE AND STATIONARY MODELS ALSO AVAILABLE

The great need for frequent physical examinations is of course more imperative, now, under wartime conditions, than when we lead more normal lives. No such examination can be considered complete without an Electrocardiogram.

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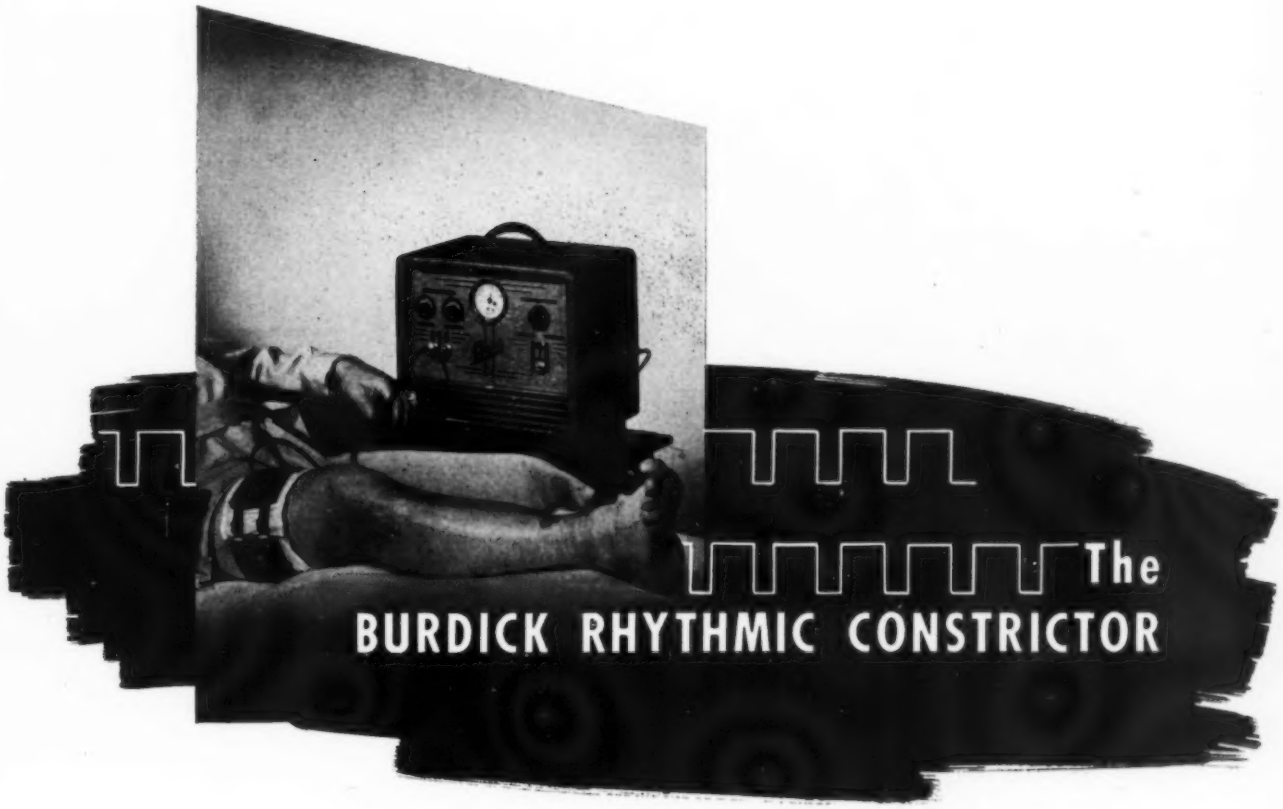
help industry in setting up such a worthwhile program. Having this in mind, we suggest the following health plan: That industrial plants of more than 25 employees who have no full-time plant physician call meetings at regular intervals at their plant with the following personnel in attendance: (1) The president of the company or the plant manager, presiding. (2) The plant physician or his appointed representative (doctors usually called upon for care of accidents). (3) The plant nurse or visiting nurse. (4) The first-aid man. (5) Director of the safety committee. (6) A representative of the employees (labor). (7) Personnel or employment manager. It is suggested that this meeting last not over one hour. Suitable topics for discussion are as follows: (1) Disabilities from accidents. (2) First aid at the plant. Equipment for the first-aid room. (3) Physical examination and the health of the worker. (4) Non-compensable illnesses such as colds and infections or surgical disabilities. (5) Cooperation of the family physician in cutting down loss of work days. (6) Ventilation and sanitary conditions in the plant (dust and chemical poisons). (7) Nutrition of workers and food conditions. (8) Contagious diseases and cooperation with the Public Health Department. These regular, periodical conferences attended by interested and informed representatives of your organization should do much to solve problems of absenteeism and raise the health standards of your plant. The nation is at war and better health means greater conservation of manpower for the production of war materials. Will you cooperate in this plan? If so, let us help you set the wheels in motion. Phone or write the Wayne County Medical Society, Temple 1-6400.'"

Minnesota

COMMITTEE on Industrial Health, in *Minnesota Med.*, September, 1944: The increasing interest in industrial health as a specialty of medicine and as a factor in the public health program of the state has been a source of encouragement to the committee. A questionnaire sent to all physicians of the state this year showed that a considerable number are willing to participate in industrial health work on a part-time or consultant basis and even more would be interested in a short course on the subject at the Center for Continuation Study on the University campus. A total of 343 responded to the questionnaire. Of these, eight indicated that they are now in full-time industrial service; 18 that they are now serving as consultants in industrial health; 84 that they are on part-time service; 47 that they are on call. A total of six who are not now in industrial health service said they would like to serve full time; 33 are willing to serve as consultants; 148 are willing to serve part time; 26 are willing to be on call. One hundred and forty declared that they would attend a course on industrial medicine at the University. The complete list of names secured through this questionnaire is now on file at the State Office and will be made available, by the order of the Council, to any employers seeking the aid of physicians to establish or extend plant medical services in their areas. The Committee will work with DR. L. W. FOKER, Director of the Division of Industrial Hygiene, and the University authorities, to arrange a course on industrial health at the University as soon as possible. Several appeals have been made to the membership on various occasions to send occupational disease reports to the Division of Industrial Health. Many physicians are failing to do so, however, and the Committee accordingly, wishes to make a special request of the delegates to see that members of their respective societies understand the purpose and importance of these reports. Many apparently do not know that a report is required by law within 24 hours whenever a case of occupational disease is diagnosed. The law provides, also, that these reports shall be used only for purposes of study and that they cannot be used in any litigation which may ensue. They are absolutely essential, however, as a basis for studies of the Division looking to better health conditions in industries of the state. Careful study of the new Occupational Disease law passed by the last legislature has developed the

—Continued on page 842.



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Impaired circulation following Frostbite
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*Linton, R. R. et al: Therapeutic Venous Occlusion, Am. Heart J., 21:6, 721-742 (1941).

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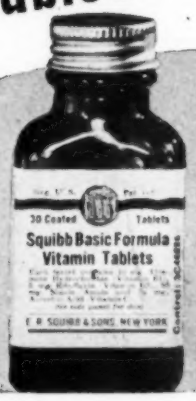

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